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THE

Gentleman's Diary,

OR THE

MATHEMATICAL REPOSITORY;

An ALMANACK

For the YEAR of our LORD 1761.

BEING

The FIRST after BISSEXTILE, or LEAP-YEAR.

Containing many useful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the delightful Study and Practice of the

MATHEMATICKS.

The Twenty-first *Almanack* published of this Kind; And the Ninth of the NEW STYLE in ENGLAND.

THE Almanacks for 1761, being all printed before the Demise of his late Majesty;

The Publick are desired to observe, that the *4th of June* is the *Birth-Day* of His present Majesty King GEORGE III; the *25th of October* the Day o[illegible] *Succession to the Crown*; and the *26th of October* the Day of His *Proclamation*.

[illegible] ad littora pulsans.

LONDON,
Printed for the Company of STATIONERS.
M DCC LXI.
[Price Nine-pence stitch'd]

To the PUBLICK.

ALL Persons who are pleased to be *Contributors* to this DIARY, by answering the *Questions, Ænigmas*, &c. or by sending in new ones, or other *Subjects* proper for the WORK, are desired to send *them* and their *Solutions* along with them, before the first Day of *May* 1761, directed for the *Authors* of the GENTLEMAN's DIARY; to be left with THO. PEAT, School-master in NOTTINGHAM; (and no where else) *Post paid*, or they will not be received.

And, as the Generality of our CONTRIBUTORS seem desirous to have a PRIZE QUESTION and a PRIZE ÆNIGMA proposed; and we, being willing to oblige them in this Respect, purpose to give an ANNUAL PRIZE of 12 *Diaries* to such Contributors as shall favour us with the best MATHEMATICAL and POETICAL Performances (sent in the Time above limited) to be delivered to such *Contributors* the CHRISTMAS next following, as we shall order in the DIARY: And we accordingly desire, that Mr. GEORGE BROWN, Teacher of the Mathematicks, on *Portsmouth Common*, will accept of 12 *Diaries*, to be sent him as soon as published, from *Stationer's Hall*, LONDON.

JANUARY hath xxxi Days.

New Moon the 6th
First Quarter the 14th
Full Moon the 20th
Last Quarter the 27th
} Day at {
46 min. past 9 Morn.
39 min. past 2 Morn.
23 min. past 6 Night.
1 min. past 11 Night.

M D	☉ Decl. South.	
1	23°	0
6	22	28
11	21	45
16	20	52
21	19	48
26	18	36

			☽ Rises		☽ Sets	
1	Th	Circumcision, or NEW-YEAR's Day.	4 M	27	8	8 M 8
2	F	Day Light begins, and Twilight	5	36	9	40
3	S	ends at 6 o'Clock.	6	42	10	26
4	D	2 Sunday after Christmas.	7	41	11	15
5	M	OLD CRISTMAS-DAY.	☽ Sets		☽ A	6
6	Tu	Epiphany, CHRIST's * app. to Gent.	4 A	47	0	56
7	W	(*Salisbury*, Wiltshire the 6th)	5	55	1	46
8	Th	Lucian, Priest & M.	7	8	2	33
9	F	*Canterbury*.	8	22	3	18
10	S	Days increased 26 minutes.	9	36	4	3
11	D	1 Sunday after Epiphany.	10	52	4	47
12	M	OLD NEW-YEARS DAY.	Morn		5	33
13	Tu	Hillary, Bish. & Con. *Preston*, Lanc.	0	10	6	20
14	W	Day 8 hours 16 min. long.	1	30	7	10
15	Th	*Barston*, Yorkshire.	2	55	8	5
16	F	*Nottingham*.	4	20	9	6
17	S	Old Epiphany.	5	47	10	9
18	D	Septuagesima Sunday.	7	0	11	14
19	M	*Preston*, Lanc.	☽ Rises		Morn.	
20	Tu	Fabian, B. of Rom. M. In 8 Days of	5 A	6	0	18
21	W	Agnes, Rom. V. & M. [S. Hil. 1 Ret.	6	33	1	17
22	Th	Vinc. S. an. Deac. M.	7	56	2	12
23	F	Term begins.	9	15	3	2
24	S	CHA. FRED. K. of *Prussia* born 1712.	10	29	3	47
25	D	Sexagesi. Sund. Conv. St. Paul.	11	42	4	30
26	M	Days increas'd an hour and 5 min.	Morn.		5	13
27	Tu	From the Day of S. Hil. in 15 D. 2 Ret.	0	54	5	56
28	W	Duration of Twilight 2 Hours.	2	5	6	40
29	Th	*Grampound*, Cornwall.	3	15	7	26
30	F	King CHARLES Mart. at *Whitehall*,	4	22	8	12
31	S	12 min past 1. 1649.				

M D	☉ Rises	☉ Sets	♄ Sets	♃ Sets	♂ Sets	♀ Sets	☿ Rises	Cl. bef. ☉
1	8h 4'	3h 56'	10 A 26	8 A 2	6 A 16	6 A 54	6 M 13	4 23'
6	8 0	4 0	10 5	7 46	6 16	7 8	6 13	6 38
11	7 56	4 5	9 45	7 30	6 17	7 22	6 19	8 43
16	7 50	4 10	9 27	7 15	6 19	7 37	6 29	10 32
21	7 43	4 17	9 9	7 1	6 22	7 51	6 40	12 3
26	7 36	4 25	8 50	6 46	6 24	8 4	6 47	13 15

FEBRUARY hath xxviii Days.

M D	☉ Decl. South.
1	16° 58′
6	15 28
11	13 52
16	12 9
21	10 24
26	8 32

New Moon the 5th
First Quarter the 12th
Full Moon the 19th
Last Quarter the 26th
} Day at {
43 min. past 3 Morn.
a Quarter past Noon.
52 min. past 5 Morn.
33 min. past 7 at Night.

M D	W D	Sundays, Holy and Remarkable Days, Length. incr. Days Terms, Fairs, &c.	☽ Rises & Sets	Moon South
1	D	Quinq. or Shrove Sunday.	5M 24	9 M 1
2	M	Candlema, or Purif. B. V. Mary.	6 19	9 51
3	Tu	Shrove Tuesday. Blazius, B. & M.	7 4	10 43
4	W	Ash Wednesday, first Day of Lent	7 38	11 33
5	Th	Agatha Sicil V. & M.	☽ Sets	0 A 12
6	F	Day 9 hours 20 min. long. and are	6A 5	1 9
7	S	now increased 1 hour 47 min.	7 20	1 56
8	D	Quadragesima. 1 Sunday in Lent.	8 36	2 41
9	M	In eight Days of the Purif. B. V. M.	9 54	3 25
10	Tu	Day Light begins 16 min. past 5.	11 14	4 12
11	W	Ember Week.	Morn.	5 3
12	Th	Term Ends.	0 36	5 55
13	F	Old Candlemas-Day.	2 0	6 52
14	S	Valentine, Bish. and M.	4 24	7 50
15	D	Reminiscere, 2 Sunday in Lent.	4 40	8 53
16	M	Twilight ends 54 min. aft. 6.	5 53	9 57
17	Tu	Day 10 h. 6 m. Night 13h. 54m. long	6 30	10 57
18	W	*Nun-Eaton*, Warwickshire.	7 4	11 54
19	Th	*Beverly*, Yorkshire.	☽ Rises	Morn.
20	F	Days increased 2 hours 37 min.	6A 46	0 46
21	S	*Norton*, Oxfordshire.	8 6	1 34
22	D	Oculi, 3 Sunday in Lent.	9 22	2 20
23	M	*Godalming*, Surrey. (*Fast.*	10 35	3 4
24	Tu	St. Matthias Ap. & M.	11 48	3 48
25	W	*Feversham*, Kent.	Morn.	4 33
26	Th	*Oundle*, Northamptonshire.	1 0	5 19
27	F	Day 10 hours 46 min. long.	2 11	5 7
28	S	*Chesterfield*, Derbyshire.	3 16	5 54

M D	☉ Rises	☉ Sets	♄ Sets	♃ Sets	♂ Sets	♀ Sets	☿ Rises	Cl. fast.
1	7h 26	4 35	8 A 29	6 A 29	6 A 26	8 A 22	6 M 56	14′ 14″
6	7 16	4 45	8 12	6 16	6 29	8 37	7 0	14 41
11	7 8	4 53	7 56	6 4	6 32	8 50	7 1	14 46
16	6 59	5 2	7 39	5 51	6 34	9 5	7 1	14 36
21	6 49	5 11	7 24	5 38	6 37	9 20	Sets	14 4
26	6 30	5 22	7 0	5 27	6 41	9 35	5 A 31	13 17

MARCH hath xxxi Days.

			M D	☉ Decl. South
New Moon the 6th	3 min. past 7 at Night.		1	7° 24
First Quarter the 13th	57 min. past 7 at Night.		6	5 28
Full Moon the 20th	Day at 14 min. past 6 Aftern.		11	3 31
Last Quarter the 28th	8 min. past 4 Aftern.		16	1 33
☉ in ♈ 19 D. 21 h.	0 m.	Apparent Time.	21	0 N 26
			26	2 24

		Davtd.	4 M	14	7 M	45
1	D	Midlent Sunday				
2	M	Cedde or Chad. B. Lit.	5	2	8	38
3	Tu	Days increaſed 3 hours 18 min.	5	40	9	29
4	W	*Melton Mowbray*, Leiceſterſhire.	6	10	10	18
5	Th	*Blandford*, Dorſetſh. *Caerwye*, Flintſh.	6	33	11	7
6	F	*Levenham*, Suffolk. *Walden*, Eſſex.	☽ Sets		11	54
7	S	Perpetua Maurit. M.	6A	26	0A	39
8	D	Judica, 5 Sunday in Lent.	7	45	1	26
9	M	Day 11 hours 26 min. long.	9	5	2	13
10	Tu	Day Light begins 4 h. 24 min.	10	29	3	3
11	W	Days increaſed 3 h. 49 min.	11	54	3	55
12	Th	Greg. M. B. of R. & C.	Morn.		4	51
13	F	Duration of Twilight 1 h. 57 min.	1	18	5	49
14	S	*Northop*, Flintſh. *Sevenoak*, Kent.	2	36	6	50
15	D	Palm Sunday.	3	43	7	52
16	M	*Penzance*, Cornwall.	4	34	8	52
17	Tu	*Malmeſbury*, Wilts. *Hariff*, Huntingd.	5	10	9	49
18	W	Ed. K. of Weſt. Sax. *Loughbr* Leic	5	37	10	43
19	Th	*Abbots Bromley*, Staff. *Ruthin*, Denb.	5	59	11	33
20	F	Good Friday.	☽ Riſes		Morn.	
21	S	Benedict Abbot. (*Faſt*	7	6	0	18
22	D	Eaſter Day. Our Saviour's Reſ.	8	21	1	3
23	M	Eaſter Monday.	9	36	1	48
24	Tu	Eaſter Tueſday.	10	50	2	32
25	W	Annunc. Lady D. Pr. Edward born.	Morn.		3	19
26	Th	*Glouceſter. St. Albans*, Hertfortſhire.	0	3	4	6
27	F	*Atherſtone*, Warwickſh. *Preſton*, Lanc	1	12	4	54
28	S	*Cobham*, Surrey. *Patrington*, Yorkſh.	2	12	5	44
29	D	Low Sunday.	3	5	6	36
30	M	Day 12 hours and 48 min. long.	3	47	7	27
31	Tu	*Durham*, laſts 3 Days	4	20	8	17

M	D	☉ Riſes	☉ Sets	♄ Sets	♃ Riſes	♂ Sets	♀ Sets	☿ Sets	Cl. bef. ☉
1		6h 34′	5h 27	6 A 59	6 M 39	6 A 44	9 A 44	5 A 53	12′ 42″
6		6 24	5 37	6 44	6 22	6 47	9 59	6 33	11 35
11		6 14	5 47	6 29	6 6	6 50	10 14	7 10	10 16
16		6 4	5 57	6 15	5 48	6 54	10 28	7 42	8 50
21		5 54	6 7	Riſes	5 33	6 58	10 43	8 2	7 20
26		5 44	6 17	5 M 50	5 18	7 2	10 56	8 2	5 47

APRIL hath xxx Days

M D	☉ Decl. North.
1	4° 44′
6	6 38
11	8 30
16	10 18
21	12 1
26	13 40

New Moon the 5th
First Quarter the 12th
Full Moon the 19th
Last Quarter the 27th
} Day at {
33 min. past 7 Morn.
29 min. past 2 Morn.
44 min. past 7 Morn.
45 min. past 10 Morn.

1	W	All Fools-Day.	4 M 46	9 M 6
2	Th	*Lutterworth*, Leiceſterſh. *Saliſb.* Wilts.	5 4	9 54
3	F	**Richard** B. of Chich.	5 21	10 41
4	S	**St. Ambr.** B. of Mil.	5 38	11 27
5	D	2 Sunday after Eaſt. Old Lady Day.	☾ Sets	0 A 13
6	M	From the Day of Eaſter in 15 Days.	8 A 17	1 3
7	Tu	*Atherſtone*, Warwickſh.	9 45	1 56
8	W	Term begins.	11 14	2 52
9	Th	Day Light begins 3 ho. 12 min.	Morn.	3 51
10	F	Day 13 hours 32 min. long.	0 38	4 53
11	S	*Newport-Pagnel*, Bucks.	1 42	5 55
12	D	3 Sunday after Eaſter.	2 42	6 55
13	M	From the Day of Eaſter in 3 Weeks.	3 22	7 53
14	Tu	Days are now increaſed 6 h. 2 min.	3 52	8 46
15	W	*Bewley*, Hampſhire. [Dorſet.	4 14	9 36
16	Th	*Dilton's-Marſh*, Wilts. *Piddle-Town*,	4 32	10 22
17	F	*Malmſbury*, Wilts.	4 46	11 7
18	S	*Cobham*, Surrey. *Derby.*	5 0	11 50
19	D	4 Sunday after Eaſter.	☽ Riſes	Morn.
20	M	From the Day of Eaſter in 1 Month.	8 A 41	0 34
21	Tu	*Modbury*, Devonſh. *Rumney*, Kent.	9 54	1 20
22	W	*Giſborough*, Yorkſh. *Shrewſb.* Shropſh.	11 5	2 7
23	Th	St. George. Martyr.	Morn.	2 55
24	F	*Lincoln. Pedleton*, Dorſetſhire.	0 10	3 43
25	S	Saint Mark, the Evangeliſt.	1 6	4 35
26	D	Rogat S. Duke of Cumberland born	1 52	5 26
27	M	From the Day of Eaſter in 5 Weeks.	2 27	6 16
28	Tu	*Soham*, Cambridgeſhire.	2 54	7 4
29	W	Rogation Week. [*Faſt.*	3 17	7 51
30	Th	Holy Thurſday, CHRIST's Aſcenſ.	3 34	8 37

M D	☉ Riſes	☉ Sets	☽ Riſes	♃ Riſes	♂ Sets	♀ Sets	☿ Sets	C. bef. ☉
1	5h 33′	6h 28′	5 M 29′	4 M 58′	7 A 5′	11 A 10′	7 A 42′	3′ 55″
6	5 23	6 38	5 11	4 42	7 9	11 21	7 5	2 24
11	5 13	6 48	4 54	4 25	7 12	11 28	Riſes	0 58
16	5 4	6 57	4 38	4 9	7 16	11 34	4 M 40	Aft. 16
21	4 54	7 7	4 21	3 52	7 19	11 38	4 27	1 28
26	4 45	7 16	4 3	3 35	7 20	11 37	4 15	2 25

MAY hath xxxi Days.

MD	☉ Decl. North.
1	15° 13′
6	16 40
11	18 0
16	19 13
21	20 18
26	21 13

New Moon the 4th
First Quarter the 11th
Full Moon the 18th
Last Quarter the 27th
} Day at {
32 min. past 5 Aftern.
54 min. past 8 Morn.
21 min. past 10 Night.
10 min past 2 Morn.

1	F	St. Phil. & Jac. Ap. & M.	3 M	49	9 M	23
2	S	*Lancaſter*. *Brecknock*.	4	4	10	10
3	D	Exaudi. 6 Sunday after Eaſter.	4	19	10	58
4	M	☋ Eclipſed, Inviſible. Term Ends.	☽ Sets		11	48
5	Tu	*Boſton*, Linc. *Monmouth*.	8A	54	0A	43
6	W	St. John Evang. ante port Lat.	10	23	1	43
7	Th	*Bath*, Som. *Aldbor*. Suff. *Leek*, St.	11	42	2	47
8	F	*Philips-Norton*, Som. (*Faſt*	Morn.		3	52
9	S	*Boſworth*, Leic. *Tockingham*, Glouceſt.	0	45	4	55
10	D	Whit-Sunday. Deſcent of Holy Gh.	1	30	5	54
11	M	Whit-Mond y.	2	2	6	48
12	Tu	Whit-Tueſday. OLD MAY-DAY.	2	26	7	37
13	W	Ember Week. *Tiddeſwell*, Derb.	2	44	8	23
14	Th	*Denby*. *Wells*, Som. *Winchelſea*, Suſſex.	2	59	9	7
15	F	*Chapel-le-frith*, Derb. *Chatham*, Kent.	3	12	9	50
16	S	*Caerwilly*, Caerm. *Cargurly*, Flintſh.	3	25	10	33
17	D	Trinity Sunday.	3	40	11	17
18	M	☽ Eclip ed, Viſible and Total.	☽ Riſes		Morn.	
19	Tu	Dunſtan, Archb. C. *Rocheſter*.	8A	54	0	3
20	W	*Galgarth*, Breckn. *Wickham*, Hants.	10	2	0	50
21	Th	*Aſhborn*, Derb. *St. Tiddy*, Cornwall.	11	2	1	39
22	F	Term begins. *Albrighton*, Shropſh.	11	51	2	31
23	S	*Bagborough*, Som. *Graies*, Eſſex.	Morn.		3	21
24	D	1 S. after Trin. Pr. Fred. Will. born.	0	29	4	10
25	M	In 8 Days of the Holy Trinity.	0	59	4	59
26	Tu	Aug. firſt Archbiſhop of Canterbury	1	22	5	46
27	W	Venerable Bede, Pr.	1	41	6	30
28	Th	*Bala*. Merioneth. *Hadſtock*, Devonſh.	1	55	7	15
29	F	K. Charles II. Birth, and Return.	2	9	8	0
30	S	*Aldſtone*, Cumb. *Worksſop*, Nott.	2	23	8	46
31	D	2 Sunday after Trinity.	2	38	9	34

MD	☉ Riſes	☉ Sets	♄ Riſes	♃ Riſes	♂ Riſes	♀ Sets	☿ Riſes	Cl. aft. ☉
1	4h 36	7h 23′	3M45	3 M18	4 M36	11 A31	4 M 4	3 10
6	4 28	7 33	3 27	3 1	4 24	11 21	3 55	3 42
11	4 20	7 41	3 9	2 44	4 13	11 5	3 46	3 59
16	4 12	7 48	2 50	2 27	4 2	10 42	3 39	4 2
21	4 5	7 55	2 31	2 9	3 50	10 14	3 29	3 50
26	3 59	8 1	2 12	1 50	3 39	9 0	3 24	3 25

JUNE hath xxx Days.

New Moon the 3d
First Quarter the 9th
Full Moon the 17th
Last Quarter the 25th
} Day at { 33 min. past 1 Morn. / 22 min. past 4 Afternoon / 31 min. past 1 Afternoon / 32 min. past 2 Afternoon

☉ in ♊ 20 D. 19 h. 57 min. App. Time.

M D	☉ Decl. North.
1	22° 8′
6	22 44
11	23 9
16	23 24
21	23 29
26	22 24

1	M	Nicom. Rom. Pr. & M.	2 M	56	10 M 6
2	Tu	*Daventry*, *Northampton*.	3	20	11 24
3	W	☉ Eclipled Invisible.	☽ Sets		0 A 27
4	Th	Prince of Wales born.	10 A	29	1 32
5	F	Boniface Bp. of Mentz. M.	11	24	2 39
6	S	Venus Tranſits the Sun.	Morn.		3 42
7	D	3 Sunday after Trinity.	0	2	4 39
8	M	From the D. of the H.T. in 3 Weeks	0	29	5 31
9	Tu	*Haddersfield*, Suſſex.	0	48	6 20
10	W	Princeſs Amelia born. Term Ends.	1	4	7 4
11	Th	St. Barnabas Ap. & M.	1	17	7 46
12	F	*Bartlow*, Eſſex. *Hadlow*, Kent.	1	30	8 29
13	S	*Kidderminſter*, Worceſt.	1	43	9 12
14	D	4 Sunday after Trinity.	2	0	9 56
15	M	*Royſton*, Somerſetſhire.	2	17	10 43
16	Tu	*Wrexham*, Denb.	2	41	11 31
17	W	St. Alban, Mart.	☽ Riſes		Morn.
18	Th	*Wellington*, Shropſh. *Wiggan*, Lanc.	9 A	43	0 21
19	F	*Ingleton*, Yorkſhire.	10	26	1 12
20	S	Tranſl. of Edw. K. of Weſt. Sax.	10	57	2 1
21	D	5 Sunday after Trinity.	11	22	2 50
22	M	King GEORGE II Inaug.	11	40	3 37
23	Tu	*Armington*, Devonſhire. (*Faſt*	11	57	4 22
24	W	St. John Bapt. Midſummer Day.	Morn.		5 5
25	Th	King GEORGE II. proclaimed 1727.	0	11	5 47
26	F	*Chapel-Silvas*, Kent. *Penſhore*, Worc.	0	24	6 31
27	S	*Boſton*, Linc. *Burton*. Staff. (*Faſt*	0	37	7 17
28	D	6 Sunday after Trinity.	0	53	8 7
29	M	St. Peter Ap. & M.	1	14	9 0
30	Tu	*Bridgenorth*, Shropſh.	1	41	9 58

M	D	☉ Riſes	☉ Set	☽ Riſes	4 Riſes	♂ Riſes	♀ Sets	♃ Riſes	Clock. ☉
1		3h 53	8h 7	1 M 48	1 M 26	3 M 26	8 A 50	3 M 22	2′ 41″
6		3 49	8 11	1 28	1 6	3 16	8 7	3 25	1 52
11		3 46	8 14	1 9	0 47	3 7	Riſes	Sets	0 55
16		3 44	8 16	0 48	0 27	2 56	3 M 5	8 A 58	0 bf. 7
21		3 43	8 17	0 28	0 7	2 47	2 44	9 22	1 10
26		3 44	8 16	0 8	11 A 44	2 39	2 25	9 33	2 1

JULY hath xxxi Days.

			M D	☉ Decl. North.
Last Moon the 2d		31 min. past 8 Morn.	1	23° 8′
First Quarter the 9th		13 min. past 2 Morn.	6	22 43
Full Moon the 17th	Day at	38 min. past 4 Morn.	11	22 6
Last Quarter the 24th		10 min. past Midnight.	16	21 21
New Moon the 31st		21 min. past 3 Afternoon	21	20 27
			26	19 24

1	W	*Hith*, Kent. *Worksop*, Nottinghamsh.	2 M	20	11 M	3
2	Th	Visit. of the B. V. Mary.	☽ Sets		0 A	10
3	F	*Dereham*, Norf. *Shrewsbury*.	9 A	50	1	16
4	S	Transl. of S. Mart. B. & C.	10	23	2	19
5	D	7 Sun. after Trin. Old Midsummer.	10	46	3	16
6	M	*Bungey*, Suff. *Lancaster*. *Liverpool*.	11	4	4	8
7	Tu	Thp. a Becket.	11	19	4	55
8	W	*Folestone*, Kent. *Machynleth*, Montg.	11	32	5	40
9	Th	*Bromley*, Devonsh.	11	45	6	23
10	F	*Howden*, York. *Wolverhampton*, Staff.	Morn.		7	6
11	S	*Peterborough*, Northampt.	0	1	7	50
12	D	8 Sunday after Trinity.	0	17	8	36
13	M	*Huntingdon*. *Woburn*, Bedf.	0	39	9	23
14	Tu	Days decreased 26 min.	1	7	10	12
15	W	Swithin, B. of Winchester translated	1	44	11	3
16	Th	*Winchest*. Hampsh. *Woodhurst*, Dorset.	2	32	11	53
17	F	*Leek*, Staff. *Stevenage*, Hertf.	☽ Rises		Morn.	
18	S	*Denbigh*. *Exeter*. *Huntingdon*.	9 A	22	0	42
19	D	9 Sunday after Trin.	9	43	1	30
20	M	Marg. V. & M. Antioch.	9	59	2	16
21	Tu	*Alberwin-Green*, Hamp. *Foulness*, K.	10	14	2	59
22	W	St. Mary Magd. Prs. Car. Mat. born	10	27	3	42
23	Th	*Daventry*, North. *Earl-Soham*, Suff.	10	40	4	26
24	F	*Faringhay*, Kent. (*Fast*.	10	55	5	10
25	S	St. James Ap. & M. (*Derby*.	11	13	5	56
26	D	10 Sunday after Trinity.	11	36	6	46
27	M	*Headon*, Yorksh. *Portsdown*, Hants.	Morn.		7	41
28	Tu	*Emlin*, Worc. *Fairford*, Glouces.	0	7	8	42
29	W	Day 15 hours and half long.	0	52	9	46
30	Th	*Caerlton*, Monm. *Linton*, Camb.	1	57	10	51
31	F	Dog Days begin. *Honiton*, Devonsh.	☽ Sets		11	55

MD	☉ Rises	☉ Sets	♄ Rises	♅ Rises	♂ Rises	♀ Rises	☿ Sets	Clubs ☉	
1	3h 46′	8 14	11 A 43	11 A 23	2 M 32	2 M 8	9 A 35	3 17″	1
6	3 49	8 11	11 24	11 4	2 25	1 53	9 31	4 9	6
11	3 53	8 7	11 4	10 45	2 19	1 38	9 21	4 54	11
16	3 58	8 2	10 43	10 24	2 13	1 26	9 7	5 28	16
21	4 4	7 56	10 24	10 5	2 8	1 17	8 52	5 50	21
26	4 11	7 49	10 4	9 46	2 4	1 9	8 30	5 57	26

AUGUST hath xxxi Days.

M D	☉ Decl. North.
1	17° 58
6	16 39
11	15 14
16	13 49
21	12 2
26	10 19

First Quartet the 7th
Full Moon the 15th
Last Quarter the 23d
New Moon the 29th
} Day at {
15 min. past 1 Afternoon.
18 min. past 7 Afternoon.
28 min. past 7 Morning.
17 min. past 11 at Night.

			☽ Sets	☉ A
1	S	**Lammas Day.** *Bath*, Som.	9 A 5	1 57
2	D	11 Sunday after Trinity.	9 21	2 44
3	M	*Carnarvon. Daventry*, Northamp.	9 36	3 31
4	Tu	*Epsom*, Surry. *Thursk*, Yorksh.	9 50	4 16
5	W	*Boston*, Linc. *Doncaster*, Yorksh.	10 5	5 1
6	Th	Transfig. of our Lord.	10 21	5 46
7	F	Name of Jesus.	10 41	6 32
8	S	*Furfut*, Cornw. *Ruthin*, Denb.	11 8	7 20
9	D	12 Sunday after Trinity.	11 42	8 8
10	M	S. Laur. Arch D. of R. & M.	Morn.	8 58
11	Tu	*Newcastle*, Northumb. *Shrewsbury*.	0 27	9 50
12	W	Old Lammas-Day. *York*.	1 23	10 41
13	Th	*Northamp.* St. *Eades*, Hert. *Stow*, Suff.	2 28	11 29
14	F	Days are shortened 2 Hours.	Rises	Morn.
15	S	*Bakewell*, Derb. *Preston*, Lanc.	8 A 9	0 16
16	D	13 Sunday after Trinity.	8 24	1 1
17	M	*Bardney*, Hampshire.	8 37	1 45
18	Tu	Day 14 h. 24 min. long.	8 50	2 27
19	W	*Dartington*, Devonshire.	9 3	3 11
20	Th	☉ Amplitude N. 16°. 35'.	9 21	3 56
21	F	*Hearnor*, Derb. *Horncastle*, Linc.	9 41	4 44
22	S	*Bracknell*, Berks. *Penkridge*, Staff. (*Fast*	10 9	5 36
23	D	14 Sunday after Trinity.	10 47	6 33
24	M	St. Barthol. Ap. & M.	11 42	7 34
25	Tu	*Llanerchemith*, Angl. *Milver*. Som.	Morn.	8 39
26	W	*Carlisle. Huntingdon. Worcester.*	0 55	9 43
27	Th	*Coventry*, Warw. *Lambeth*, Surry.	2 21	10 44
28	F	St. Au. B. of Hip C. D.	☽ Sets	11 42
29	S	**Beheading of John Bapt.**	7 A 30	0 A 36
30	D	15 Sunday after Trinity.	7 47	1 25
31	M	☉ due E. 6 ho. 25' Alt. 12°. 20'.		

M D	☉ Rises	☉ Sets	♄ Rises	♃ Rises	♂ Rises	♀ Rises	☿ Sets	Cl. bef. ☉
1	4h 20	7 40	9 A 40	9 A 22	1 M 59	1 M 0	8 A 2	5' 47"
6	4 27	7 32	9 21	9 3	1 56	0 57	7 35	5 21
11	4 35	7 24	9 2	8 43	1 54	0 55	7 7	4 41
16	4 44	7 15	8 44	8 24	1 53	0 55	Rises	3 48
21	4 53	7 6	8 25	8 4	1 52	0 57	4 M 11	2 41
26	5 2	6 57	8 [illegible]	7 45	1 51	1 0	33 41	1 22

SEPTEMBER hath xxx Days.

M D	☉ Decl. North.
1	8° 10′
6	6 19
11	4 20
16	2 30
21	0 33
26	1 S 24

First Quarter the 6th
Full Moon the 14th
Last Quarter the 21st
New Moon the 28th
} Day at { 40 min. past 7 Morn. / 29 min. past 9 Morn. / 37 min. past 2 Aftern. / 19 min. past 9 Morn.

☉ in ♎ 22 D. 9 h. 31 min. App. Time.

			☽		☽	
1	Tu	**Giles** Abbot & Conf.	8	A 0	2	A 11
2	W	*Richmond-Rood*, North.	8	15	2	58
3	Th	*Brecknock*, 6 Days. *Bridgeſtock*, Dev.	8	30	3	44
4	F	*Bartholomew*, Lond. *Monmouth*, Norw	8	51	4	31
5	S	*Chipping Norton*, Oxf. *Kilnotton*, Cornw	9	14	5	20
6	D	16 Sunday after Trinity.	9	46	6	9
7	M	Dog Days End.	10	28	7	0
8	Tu	**Nativ.** of the B. V. M. *Wirkſw.* Der.	11	19	7	52
9	W	*Atherſtone*, Warw. *Stourbridge*, Worc.	Morn.		8	43
10	Th	Day 12 hours 56 m. long.	0	21	9	32
11	F	*Tallowdown*. Dorſetſh.	1	31	10	18
12	S	*Whitehaven*, Cumb. *Wilton*, Wilts.	2	45	11	5
13	D	17 Sunday after Trinity.	3	59	11	50
14	M	**Holy Croſs** Day.	☽ Riſes		Morn.	
15	Tu	*Durham*. (L. Elſtob.)	7	A 7	0	33
16	W	Ember Week.	7	20	1	18
17	Th	Lambert, Biſh. & M.	7	35	2	4
18	F	*Maſham*, Yor. *Southw. Stirbitch*, Cam.	7	54	2	51
19	S	*Carliſle*, Cumb. *Northampton*. (*Faſt*	8	20	3	42
20	D	18 Sunday after Trinity.	8	53	4	37
21	M	St. Matthew, Ap. Ev. & M	9	42	5	37
22	Tu	*Allchurch*, Worceſt.	10	48	6	39
23	W	*Halkin*, Wilts. *Poincaſtle*, Radnor.	Morn.		7	41
24	Th	*Cheſhunt*, Hertf. *Kanwyneck*, Shropſh	0	7	8	42
25	F	*Cheſterfield*, Derb *Rippon*, Yorkſh.	1	35	9	35
26	S	**St. Cyprian**, Archb. of Car. & M.	3	2	10	33
27	D	19 Sunday after Trinity.	4	27	11	24
28	M	*Glouceſter*. *Tuxford*, Nott.	☽ Sets		0	A 12
29	Tu	St. Michael and all Angels	6	A 28	0	58
30	W	St. Jer. Pr. C. & D. *Wrexham*, Denb.	6	45	1	44

M. D.	☉ Riſes	☉ Sets	♄ Riſes	♃ Riſes	♂ Riſes	♀ Riſes	☿ Riſ.	Sl. after ☉
1	5h 14′	6 45	7A 44	7A 23	1M 51	1M 9	3M 30	0′ 24
6	5 23	6 36	7 25	7 4	1 51	1 16	5 42	2 1
11	5 33	6 26	7 6	6 45	1 50	1 26	4 8	3 41
16	5 43	6 16	6 48	6 27	1 50	1 38	4 42	5 27
21	6 0	6 0	6 29	Sets	1 49	1 50	5 17	7 10
26	6 7	5 52	6 11	5M 39	1 49	2 3	5 52	8 52

OCTOBER hath xxxi Days.

M D	☉ De South
1	3° 2
6	5
11	7
16	9
21	10
26	12

First Quarter the 6th, Full Moon the 13th, Last Quarter the 20th, New Moon the 27th — Day at: 45 min. past 2 Morn. / 52 min. past 10 Night. / 6 min. past 9 Night. / 22 min. past 10 Night.

1	Th	Remig. B. of Rhemes.	7 A 2	2 A	3
2	F	*Nottingham*, lasts 8 Days, for Hops,	7 24	3 M	2
3	S	Cheese and all Sorts of Cattle	7 52	4	1
4	D	20 Sunday after Trinity.	8 29	5	
5	M	*Llanvilling*, Montg. *Lamport*, Som.	9 17	5	55
6	Tu	Faith, V & M. *Hull*, Yorksh.	10 16	6	4
7	W	*Billericay*, Essex. *Countess-Court*, Wilt.	11 23	7	3
8	Th	*Abingdon*, Berks. *Challock*, K. *Swansey*.	Morn.	8	2
9	F	St. Denis Areop. B. & M. *Lancast*.	0 35	9	
10	S	Old Michaelmas-Day.	1 49	9	5
11	D	21 Sunday after Trinity.	3 4	10	3
12	M	*Banbury*, Oxf. *Devizes*, Wilts.	4 19	11	2
13	Tu	Translat. of K. Ed. Conf.	☽ Rises	Morn	
14	W	*Buttonmoor*, Shropsh. *Worksop*, Not.	5 A 50	0	
15	Th	*Falsley*, Warw.	6 7	0	5
16	F	*Bosworth*, Leic. *Hay*, Breckn.	6 29	1	4
17	S	Etheldred, Virg. *Lynn*, Norf.	7 1	2	4
18	D	22 Sunday after Tr. St. Luke Evang.	7 45	3	4
19	M	*Market-Harbor*. Leic. *Ouford*. *Yarme*.	8 45	4	4
20	Tu	*Ashborne*, Derb. *Co'chester*. *Hereford*.	10 2	5	4
21	W	*Heanor*, Derb. *Banbury*, O. *Gainsb*. L.	11 24	6	4
22	Th	King George II. Crowned, 1727.	Morn.	7	4
23	F	*Ripley*, Derb. *Saff Wald*. Ess. *Stock*. Ch.	0 50	8	3
24	S	*Tamworth*, Staff. *Windsor*, Berks.	2 16	9	2
25	D	23 Sunday after Trin.	3 37	10	1
26	M	*Chepstow*, Monm. *Grantham*, Linc.	4 58	10	5
27	Tu	☉ Eclipsed Invisible. (*Fast*	☽ Sets	11	4
28	W	St. Sim. & Jude. Ap. & M.	5 A 11	0 A	2
29	Th	*Askrigg*, Yor. *Bourne*, Lin. *Burton*, Staff	5 32	1	1
30	F	*Banbury*, Ox. *Ely*, Cam. *Maidenhead*, B.	5 56	2	5
31	S	*Bridgenorth*, Shrop. *Devizes*. *Settle*, Y.	6 27	2	5

M D	☉ Rises	☉ Sets	☽ Sets	♃ Sets	♂ Rises	♀ Rises	☿ Sets	Cl. aft. ☉
1	6h 12	5h 47	6 9	5 M 23	1 M 50	2 M 18	5 A 59	10′ 30′
6	6 22	5 37	5 48	4 4	1 49	2 31	5 51	12 0
11	6 32	5 27	5 29	4 45	1 48	2 45	5 44	13 20
16	6 42	5 17	5 8	4 27	1 45	3 0	5 36	14 28
21	6 51	5 8	4 48	3 50	1 44	3 15	5 31	15 21
26	7 1	4 58	4 27	3 28	1 42	3 30	5 24	15 56

NOVEMBER hath xxx Days.

M. D.	☉ Decl. South.
1	14° 37′
6	16 9
11	17 36
16	18 54
21	20 4
26	21 4

Laſt Quarter the 4th
New Moon the 12th
Laſt Quarter the 19th
New Moon the 26th
} Day at {
11 at Night.
34 min. paſt 11 Morn.
34 min. paſt 4 Morn.
half paſt 2 Afternoon.

D	24 Sunday after Trin. All Saints.	7 A	12	3 A	48
M	*Leek*, Staff. *Loughbor.* Leic All Souls	8	7	4	40
Tu	On the Morrow of all Souls.	9	10	5	30
W	*Appleſhaw*, Hants.	10	19	6	18
Th	Papists Conſpiracy. *Beverly*, Yorkſh.	11	32	7	4
F	Leonard, Conf. Term Begins.	Morn		7	48
S	Prince Hen. Fred. born, 1745.	0	46	8	31
D	25 Sunday after Trinity.	1	59	9	15
M	*Darlington*, Durham. *Stamford*, Linc.	3	15	10	0
Tu	King Geo. II. born, 1683.	4	33	10	46
W	St Martin Bp. and Conf.	5	54	11	36
Th	☽ Eclipſed Invi[illegible]ere, but Total.	☽ Riſes		Morn.	
F	Bricius, Bp. *York*, Ch. Meſban.	5 A	0	0	30
S	*Brecknock*, 6 Days. *Carmarthen.*	5	39	1	29
D	26 Sunday after Trinity.	6	34	2	31
M	*Andover*, Hamps. *Caerfilly*, Glam.	7	46	3	36
Tu	Hugh, Bp. of Linc. *Launceſton.*	9	9	4	38
W	In eight Days of Saint Martin.	10	37	5	36
Th	*Woodcot*, Oxf. *Yarme*, Yorkſh.	Morn.		6	29
F	Edmund, K. & M.	0	1	7	20
S	*Garſtang*, Lanc. *Lamport*, Som.	1	23	8	6
D	27 Sunday after Trinity.	2	42	8	52
M	St. Clem. I. B. of R. & M.	3	58	9	36
Tu	Days are now decreaſed 8 ho. 12 m.	5	14	10	20
W	Prince Wil. Henry born, 1734.	6	32	11	6
Th	☽ Eclipſed, Invisible.	☽ Sets		11	55
F	*Littlebury*, Eſſex.	4 A	22	0 A	45
S	Term Ends *Glouceſter. Lincoln. (Faſt*	5	0	1	34
D	Advent Sunday.	5	50	2	25
M	S. And. A. & M. Pra. Dow. Wales b.	6	52	3	16

M D	☉ Riſes	☉ Sets	♄ Sets	♃ Sets	♂ Riſes	♀ Riſes	♀ Sets	Cl. aſt. ☉
1	7h 12	4h 47	4 M 1	3 M 3	1 M 39	3 M 47	5 A 10	16 14
6	7 21	4 38	3 40	2 42	1 36	4 1	5 16	16 7
11	7 29	4 30	3 18	2 21	1 32	4 16	5 14	15 40
16	7 37	4 22	2 56	2 1	1 28	4 31	5 11	14 51
21	7 4[illegible]	4 15	2 3[illegible]	1 40	1 23	4 45	5 2	13 42
26	7 5[illegible]	4 [illegible]	2 12	1 20	1 17	4 58	4 46	12 13

DECEMBER hath xxxi Days.

M D	☉ Dec. South
1	21° 56
6	22 36
11	23 15
16	23 23
21	23 28
26	23 27

First Quarter the 4th
Full Moon the 11th
Last Quarter the 18th
New Moon the 26th
} Day at {
54 min. past 6 at Night
11 min. past 11 Night.
5 min. past 2 Aftern.
55 min. past 8 Morn.

☉ ♑ 21 D. 1 h. 7 min. App. Time.

1	Tu	*Rotherham*. Yorksh. (Abr. Horsfall.)	7 A 58	4 A	5
2	W	*Hoxne*, Suffolk.	9 9	4	52
3	Th	*Darlington*, Durham. (Luke Elstob.)	10 21	5	36
4	F	*Atherstone*, War. *Bangor*. *Thurok*, York	11 32	6	16
5	S	*Colford*, Gloucestershire.	Morn.	6	59
6	D	2 Sunday in Advent.	0 45	7	41
7	M	Day 7 hours 56 min. long.	1 59	8	26
8	Tu	Conc**e**pt. of the B. V. M.	3 15	9	13
9	W	*Bradford*, Wilts.	4 37	10	4
10	Th	*Kimbolton*, Hunt. *Newport*, Shrop.	6 4	11	0
11	F	*Bewdley*, Worc *Preston*, L. *Roch*. Kent.	☽ Rises	Morn.	
12	S	*Bedal*, York. *Chorley*, Dev. *Shrewsbury*	4 A 7	0	2
13	D	3 Sunday in Advent.	5 15	1	6
14	M	Days decreased 8 ho. 46 min.	6 38	2	13
15	Tu	*Atherstone*, Warw. *Namptwich*, Chesh.	8 6	3	15
16	W	Ember Week. ☿ Sapientia.	9 35	4	13
17	Th	*Exeter*, Devonsh. *Grantham*, Linc.	11 0	5	6
18	F	*Spalding*, Linc.	Morn.	5	55
19	S	*Bedford*, Northampton. (*Fast*	0 19	6	39
20	D	4 Sunday in Advent.	1 35	7	24
21	M	St. Thomas, Ap. & M.	2 52	8	8
22	Tu	*Newport-Keams*, Montgom. [past 5.	4 8	8	53
23	W	Day-light b 1 m af. 6 Tw. e. 59 m.	5 22	9	39
24	Th	Durat. of Twil. 2 h. 11 m. (*Fast*	6 35	10	26
25	F	CHRISTMAS-DAY.	7 44	11	17
26	S	St. Stephen, First Martyr.	☽ Sets	0 A	7
27	D	1 Sunday af. Chr. S. John, Ap. & Ev.	4 A 27	0	58
28	M	Innocents Day.	5 33	1	47
29	Tu	*Cockhill*, Som.	6 43	2	35
30	W	*Maiden-Bradley*, Wilts. [*this Year*)	7 54	3	19
31	Th	Silvest. B. of Rome (*Good bye, for*	9 3	4	1

M D	☉ Rises	☉ Sets	♄ Sets	♃ Sets	♂ Rises	♀ Rises	☿ Sets	Cl. aft ☉
1	7h 54′	4h 3′	1M 52	1 M 0	1M 11	5M 12	4 A 18	10′ 25
6	8 1	3 59	1 30	0 39	1 4	5 25	Rises.	8 21
11	8 5	3 55	1 9	0 19	0 57	5 40	6 M 23	6 6
16	8 7	3 53	0 47	11 A 55	0 50	5 53	6 7	3 42
21	8 8	3 52	0 26	11 35	0 42	6 5	6 9	1 11
26	8 7	3 53	0 4	11 17	0 33	6 17	6 17	1 bef. 20

A TABLE of all the KINGS and QUEENS of *England*, since the Conquest.

The Year of the Birth of each King and Queen; also the Year, Month, and Day, whereon they began to reign: beginning the Year the first Day of January. 1761.			The Length of each Reign.			The Years expired since each Reign began and ended.	
Names.	Born.	Began to Reign.	Y.	M.	D.	Beg.	End.
William Conq.	1027	1066 October 14	20	10	26	695	674
William Rufus	1057	1087 Septem. 9	12	10	24	674	661
Henry I.	1068	1100 Auguſt 2	35	4	0	661	626
Stephen	1105	1135 Decem. 1	18	10	24	626	607
Henry II.	1132	1154 October 25	34	8	11	607	572
Richard I.	1156	1189 July 6	9	9	0	572	562
John	1166	1199 April 6	17	6	13	562	545
Henry III.	1207	1216 October 19	56	1	0	545	489
Edward I.	1239	1272 Novem. 16	34	7	21	489	454
Edward II.	1284	1307 July 7	19	6	13	454	434
Edward III.	1312	1327 January 20	50	5	1	434	384
Richard II.	1366	1377 June 21	22	3	8	384	362
Henry IV.	1367	1399 Septem. 29	13	5	21	362	348
Henry V.	1389	1413 March 20	9	5	11	348	339
Henry VI.	1421	1422 Auguſt 31	38	6	4	339	300
Edward IV.	1442	1461 March 4	22	1	5	300	278
Edward V.	1471	1483 April 9	0	2	13	278	278
Richard III.	1443	1483 June 22	2	2	0	278	276
Henry VII.	1457	1485 Auguſt 22	23	8	0	276	252
Henry VIII.	1492	1509 April 22	37	9	6	252	214
Edward VI.	1537	1547 January 28	6	5	8	214	208
Mary I.	1516	1553 July 6	5	4	11	208	203
Elizabeth	1533	1558 Novem. 17	44	4	7	203	158
James I.	1566	1603 March 24	22	0	3	158	136
Charles I.	1600	1625 March 27	23	10	3	136	112
Charles II.	1630	1649 January 30	36	0	7	112	76
James II.	1633	1685 February 6	4	0	7	76	72
William III.	1650	1689 Feb. 13	5	10	15	72	59
Mary II.	1662		13	0	23	72	67
Anne	1665	1702 March 8	12	4	24	59	47
George I.	1660	1714 Auguſt 1	12	10	10	47	34
George II.	1683	1727 June 11	whom God preſerve.				

A Compendious TABLE of INTEREST,

Shewing the Intereſt of any Sum of Money, from a Million to a Pound; for any Number of Days, at any Rate of Intereſt.

N°.	l.	s.	d.	q.
1000000	2739	14	6	0 ,99
900000	2465	15	0	3 ,29
800000	2191	15	7	1 ,59
700000	1917	16	1	3 ,89
600000	1643	16	8	2 ,19
500000	1369	17	3	0 ,49
400000	1095	17	9	2 ,79
300000	821	18	4	1 ,09
200000	547	18	10	3 ,40
100000	273	19	5	1 ,70
90000	246	11	6	0 ,32
80000	219	3	6	0 ,96
70000	191	15	7	1 ,59
60000	164	7	8	0 ,22
50000	136	19	8	2 ,85
40000	109	11	9	1 ,48
30000	84	3	10	0 ,11
20000	54	15	10	2 ,74
10000	27	7	11	1 ,37
9000	24	13	1	3 ,23
8000	21	18	4	1 ,10
7000	19	3	6	2 ,96
6000	16	8	9	0 ,82
5000	13	13	11	2 ,58
4000	10	19	2	0 ,55
3000	8	4	4	2 ,41
2000	5	9	7	0 ,27
1000	2	14	9	2 ,14

N°.	l.	s.	d.	q.
1000	2	14	9	2 ,14
900	2	9	3	3 ,12
800	2	3	10	0 ,11
700	1	18	4	1 ,10
600	1	12	10	2 ,86
500	1	7	5	3 ,70
400	1	1	11	0 ,50
300	0	16	5	1 40
200	0	10	11	2 ,30
100	0	5	5	3 ,01
90	0	4	11	0 ,71
80	0	4	4	2 ,41
70	0	3	10	0 ,11
60	0	3	3	1 ,81
50	0	2	8	3 ,51
40	0	2	2	1 ,21
30	0	1	7	0 ,90
20	0	1	1	0 ,60
10	0	0	6	2 ,30
9	0	0	5	3 ,67
8	0	0	5	1 ,04
7	0	0	4	2 ,41
6	0	0	3	3 ,78
5	0	0	3	1 ,15
4	0	0	2	2 ,52
3	0	0	1	3 ,89
2	0	0	1	1 ,26
1	0	0	0	2 ,63

RULE.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two laſt Figures to the Right Hand, and the reſt you muſt find in the Table.

Example, What is the Intereſt of 100 l. for 365 Days at 5 per Cent.

N°. of Days 365
multiply by 100
Product 36500
multiply by 5 Rate p. Cent.
1825100

Then in the Table
againſt 1000 is 2 14 9 2 ,14
800 2 3 10 0 ,11
20 0 1 1 0 ,60
5 0 0 3 1 ,15
Anſw. 5 0 00 ,00

A CALCULATION of a *Lunar Eclipse*, which will happen in the Year 1761, for the *Meridian* of LONDON; by Mr. THO. ALLEN.

					D.	H.	′	″
Equal Time of the Orbit ☌ in *May*					18	10	25	57
Place of the ☉ in ♉						28°	3	15
Place of the ☽ in her Orbit ♍					8	28	3	15
Mean Anomaly ☉					10	18	6	36
Place ☽'s Apog. in ♑						4	15	33
Annual Argument					10	23	47	42
Moon's North Node, in ♊						0	1	28
Argument of Latitude					5	28	1	47
Latitude ☽ N. D.						0	10	29
Equation of Time, add					D.	H.	3	59
Apparent Time of the Orbit ☌					18	10	19	56
True Hourly Motion ☽ ☌ ☉							27	49
Time of Reduction sub. and add.							1	1
Apparent Time of the { Ecliptic ☌					18	10	14	56
Apparent Time of the { Middle						10	16	58
Horizontal Parallax { ☉								10
Horizontal Parallax { ☽							54	10
Sum							54	20
Semidiameter ☉ Sub.							15	53
Semid. ⊖ Shadow							38	27
Semid. ☽ add							14	53
Sum							53	20
Lat. ☽ sub.							10	29
Parts deficient							42	51
Digits eclipsed						17°	16	30
Motion of half Duration						H	52	17
Time of half Duration						1	52	47
Motion of half Duration of total Darkness							21	6
Time of half Duration of total Darkness					D	H	45	30
Hence the Beginning of the Eclipse is *May*					18	8	24	11
P. M.	Beginning of total Darkness					9	31	28
	Ecliptic ☌					10	14	56
	Middle of the Eclipse					10	16	58
App. Time.	End of total Darkness					11	2	28
	End of the Eclipse					12	9	45
	Duration of total Darkness					1	31	0
	Duration of the Eclipse					3	45	34

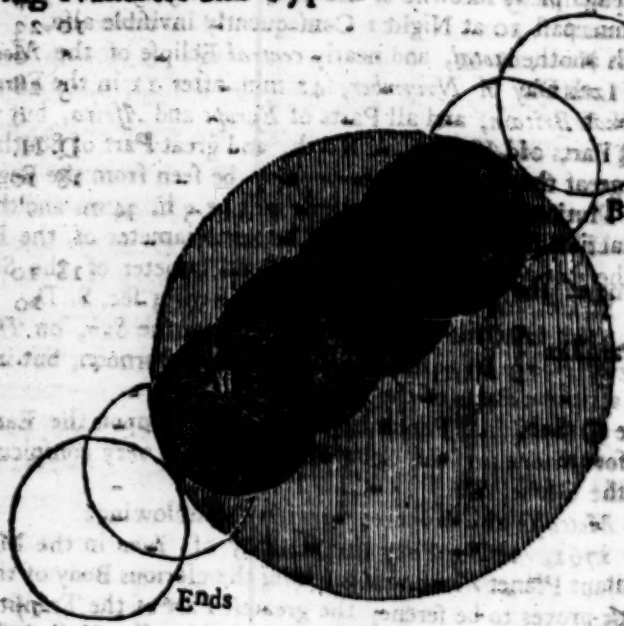
Mr. *Allen* also observes, That on *June* 6, 1761, will be a *Transit* of Venus over the Sun's Disk; the Times, &c. are as follows:

	At *Spalding*. D	H	′	At the *Hague*. D	H	′
Immersion *June*	6	2	24	6	2	40
Middle		5	35		5	51
Emersion		8	46		9	2

Computations of the Eclipses of the *Sun* and *Moon*, which will happen in the Year 1761. Sent us by Mr. *John Mitchell*.

The First, is of the *Sun*, on *Monday* the 4th Day of *May*, 43 Minutes past 5, in the Afternoon apparent Time; but invisible here, and to all known Parts of the Earth.

The Second, is a total Eclipse of the *Moon*, on *Monday* the 18th Day of *May*, and (if Clouds interpose not) will be visible from the Beginning to the End; as appears from the following Numbers and Type:



Night A. P.	London			York			Wentworth			Richmond			L. ☽ N.D. 10′ 22″
	H.	m.	s.	H.	m.	s.	H.	m.	s.	H.	m.	s.	Eccent. = 59644
Eclipse beg.	8	31	56	8	27	56	8	26	26	8	25	8	L. A. ☌ 29 55 5
Cent. Ing.	9	4	58	9	0	58	8	59	28	8	58	10	H. P. ☽ = 54 5
Tot. D. Beg.	9	39	5	9	35	5	9	33	35	9	26	17	H M ☽ ☌ ☉ 27 5
Ecliptic ☌	10	25	22	10	21	22	10	19	52	10	20	34	Semid. ☽ 14 5
Mid. of Ecl.	10	27	38	10	23	38	10	22	8	10	20	50	D° Sh. ☾ 39 4
Tot. D. ends	11	16	11	11	12	11	11	10	41	11	9	23	Dur. Ec. 3 51 24
Centr. Egr.	11	50	18	11	46	18	11	44	48	11	43	30	D° tot. d. 1 37
Eclip. ends.	12	23	20	12	19	20	12	17	50	12	16	32	Dig. ec. 1 7 47 53

But the Times of the Middle of this Eclipse, from different Tables, for the Meridian of *London*, are as follows:

		m.
Brent's, according to the Theory		19 5
Dr. *Halley*	H	21 31
Palladium (1757)	10	23 40
Whiston, according to *Flamsteed*		28 11

At the Beginning of this Eclipse, the Moon will be Vertical to the *Indian* Ocean, East of the Island of *Madagascar*, Lat. 19° 18′ S. Long. 51° 7′ E. from *London*. At the Middle to the South Part of *Africa*, Lat.

19° 36′ S. Lo. 23° 5′ E. And at the End of the Eclipſe, Vertical the Ethiopian Ocean, South of the Iſland of *St. Helena*, Lat. 19° 54′ and Long. 4° 56′ W. from *London*: Therefore the Eclipſe will be vi- ble, over all *Africa*, greateſt Part of *Europe* and *Aſia*; *South America*, d the *Britiſh* Plantations in *North America*: But, in the *Eaſt Indies*; rt of *Siberia*, *Tartary*, and *China* the Moon ſets eclipſed; and riſes lipſed in *America*; the N. W. of *Ireland* and *Scotland*, the N. Parts of *nmark*, and the North Eaſt Parts of *Ruſſia*.

The Third Eclipſe is a ſolar one, on *Wedneſday* the 3d Day of *June*, Minutes after One in the Morning: Therefore inviſible.

The Fourth Eclipſe is likewiſe of the *Sun*, on *Tueſday* the 27th Day of *tober*, 25 min. paſt 10 at Night: Conſequently inviſible alſo.

The Fifth is another *total*, and nearly *central* Eclipſe of the *Moon*, on *urſday* the 12th Day of *November*, 41 min. after 11 in the Forenoon, viſible in *Great Britain*, and all Parts of *Europe* and *Africa*, but will be ſible to moſt Parts of *Aſia*; to all North, and great Part of South *Ame- ca*: In the great *South Sea*, where it may be ſeen from the Beginning the End. The Duration of the Eclipſe will be 3 h. 34 m. and the Du- tion of total Darkneſs 1 h. 38 m. The Semidiameter of the Earth's adow at the Moon, is 44 m. 11 ſec. Semidiameter of the Sun and oon 16 m. 16 ſec. and the Moon's Latitude 2 m. 3 ſec. S. D.

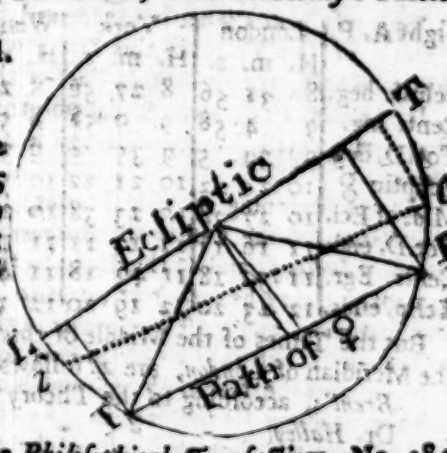
The Sixth, and laſt this Year, is an Eclipſe of the *Sun*, on *Thurſday* e 26th Day of *November*, 36 min. paſt 2 in the Afternoon, but inviſible ere, and to all theſe Parts of the World.

The Centre of the Lunar Penumbra does not come upon the Earth this ear; therefore, none of the Solar Eclipſes can be very conſpicuous on y Part of the Globe, *&c.*

Mr. *John Metcalfe* alſo favoured us with the following:

This Year 1761, on *Saturday* the 6th Day of *June* in the Morning, e moſt brilliant Planet *Venus* will paſs over the glorious Body of the *Sun*; nd, if the Air proves to be ſerene, the greateſt Part of the Tranſit will be ſible, according to the following Calculation, from Dr. *Halley*'s Tables:

June 1761. AM.	R. Obſer. AT. h	m	s	Paral. m	s
				+	
irſt Contact ☿ ⊙	2	5	23	6	52
entral Ingreſs	2	16	41	6	45
wholly on Diſk	2	28	15	6	39
earest ap. of Cent	5	24	50	3	25
cliptic Conjunct.	5	46	17	3	18
ime of Emerſion	8	12	19	1	21
entral Egreſs	8	31	54	1	41
nd of the Tranſit	8	43	12	2	2
eoc. Lat. ☿ S. A.		9	51	+	21



But, Dr. *Halley* himſelf, in the *Philoſophical Tranſactions*, No. 384, as given us the Time of this Tranſit, as follows:

The Beginning 2h. 9m. } *June* 6, 1761. In the Morning.
Middle 5 55
The End 9 41

Inclination of Orbit ☿ 2° 18′ of Path, i. e. to the Parallel of Decli-

Long. ☉ and Venus at Ecliptic ☌	♊	15° 35′ 50″	30
Aphelion of Venus	♒	7 29 17	
Ascending Node Venus	♊	14 29 36	37
Diff. ☉ and Venus from the ascending Node		1 6 13	43
Inclination of the Orbit Venus		3 55	30
Semediameter of the ☉		15 50	24
Ditto, of Venus		36	
Motion of Venus in its Orbit, during the Transit		24 50	
Ditto, reduced to the Ecliptic		24 41	
Visible Lat. Venus at Ingress I		7 47	
Ditto, at the Egress E		11 29	
Angle visible Path Venus		8 31 35	
Elongation Venus at the Point I		13 47	
Ditto, at E		10 54	
Angle of Incidence		52 1 44	
Angle LCI = Arch LI		29 26 39	
Arch TE = Angle TCE		46 29 50	
Mean hourly Motion Venus à ☉		3 57	
True Motion Venus à ☉ in 3 h. before ☌		11 49	49
Ditto in 3 h. after Conjunction		11 51	53
Angle Ecliptic with the Vertical ☌		56 2 12	
Diff. ☉ and Venus à Nonagesima Degree		26 27 11	
Right Ascension ☉ and Venus at ☌		74 21 29	
Altitude Venus at Conjunction		15 23 11	
Ditto, at Sun's Limb E		40 53 18	

Logarithm dist. Venus à ☉ = 4,8611917
Log. of the dist. ⊖ à ☉ = 5,0066887
Log. dist. of ⊖ from Venus = 4,4455819

This refulgent Planet is Occidental, or an Evening Star, from the beginning of the Year, to this Day; when it will become Oriental, or Morning Star, the remaining Part of the Year.

Its greatest *Verspertine* Elongation this Year is 45° 52′ 20″, at Last day, and greatest *Matutine* Elong. is 45° 44′ 30″. about the Middle of *August*.

At the Beginning of this Transit, the Sun will be Vertical to the *Pacific Ocean*, to the East of the *Ladrone Islands*; at the Middle, to *Siam* the *East Indies*; and at the End, to the Middle of *Arabia Felix*: Consequently it may be seen over all *Asia*, *Russia*, *Poland*, *Sweeden*, *Norway*, the *Laplands*, and most Parts within the *Artic-Circle* from the Beginning to the End; but only visible in Part to *Africa*, the Western Kingdoms of *Europe*, and the North West, and North East Parts of *North America*; but not at all in *South America*; for the Transit will be ended before the Sun rises on the Eastern Coast of the *Brasils*.

This uncommon and very rare Phænomenon has never been seen by Mortals since the Creation, except once, by the famous *Jer. Horrox*, who, in the Year 1639, on the 24th Day of *November*, observed *Venus* in the *Sun*, 19 min. past 3 in the Afternoon; this is its first Return to

Sun ſince that Time; but as it will only once more enter its Diſk in Space of 113 Years, it is hoped thoſe Gentlemen who are qualified the Taſk, and provided with proper Inſtruments, will make ſome good ſervations on this *Tranſit*; becauſe, from ſuch Obſervations, the *Pa-lax* of the *Sun* may be aſcertained; and by that Means the Diſtances of *Earth*, and *Planets* from the *Sun*, according to the Method given by *Halley*, in the *Phil. Tranſ.* No. 348, may be determined to within a th Part of the whole; but which, by the Parallax of *Mars*, can ſcarce known to a 5th.

The Solution of this noble Problem, one of the higheſt in Nature, has n attempted in all Ages of *Aſtronomy*, and by ſeveral Methods as may ſeen in moſt Books of *Aſtronomy*; but as an Error of one ſingle *Second* the Obſervation, even by the *beſt* of thoſe Methods, will create a Dif-ence of ſeveral Millions of Miles in the *Sun's* Diſtance from the *Earth*; as an Angle can ſcarcely be taken *true* to one *Second*; it is certain that true Dimenſions of the *ſolar* Syſtem, cannot be known by any of the thods hitherto uſed for that Purpoſe. However, they all agree that *Sun's* Parallax is very minute, even leſs than a Quarter of a *firſt* Mi-e. The laſt Obſervations, by the Parallax of *Mars*, giving it 12, or ner 10 Seconds; from whence the Diſtance of the *Sun* will be 000.000 Miles.

Mr. *Machin* thinks, that the Motion of the *Sun* from the *Moon's Node*, l, perhaps, furniſh the beſt Method of adjuſting and fixing the *Sun's* e Diſtance: And by his Calculation, the *Sun's* Parallax is only 8 Se-nds, and its Diſtance 25000 Semidiameters of the *Earth*, or 99.625.000 les (ſee Page 24 of the Laws of the *Moon's* Motion, annexed to Sir AAC NEWTON's *Principia* in Engliſh) which is above 18.000.000 les greater than the Diſtance obtained from the Parallax of *Mars*: But s Tranſit (if proper Obſervations be made) will decide the Diſpute, and m ſuch Determination, new Tables of the Diſtances, and Magnitudes the *Planets* and *Satellites* may be computed.

N. B. The celebrated Mr. *Martin* has publiſhed a very curious Re-ſentation of all the Tranſits of *Venus* over the Sun for 1000 Years in arge Copper Plate Print; with the Inclination of the Planets Orbit, h at the aſcending and deſcending Node, and the Diſtances of the net from the *Sun's* Center, &c. to which I refer thoſe who have not iſure, or Inclination to undertake a tedious and laborious Calculation m the Tables.

JOHN METCALFE.

r. *Alex. Rowe*, of *Penzance*, ſent the following Calculati-ons of the Lunar Eclipſe, from *Leadbetter's* Tables: For

	London.	Rome.	Madrid.	Liſbon.	Penzance.
g. *May* 18	11h 54′ 52″	12 46′ 52″	11h 41′ 52″	11h 17′ 52″	11h 32′ 52″
. tot. dark	12 59 5	13 51 5	12 46 5	12 22 5	12 37 5
liptic 8	13 33 48	14 25 48	13 20 48	12 56 48	13 11 48
iddle	13 46 32	14 38 32	13 33 32	13 9 32	13 24 32
d tot. dar.	14 33 59	15 25 29	14 20 59	13 56 59	14 11 59
. of Ecl.	15 38 12	16 30 12	15 25 12	15 1 12	15 16 12

Mr. *Rowe's* Calculation of the Tranſit of *Venus*.

Makes the Beginning. Apparent Time, at *London*.

June 6 - - - - 3h 14′

A. M. { Middle - - - - - 6 43
End - - - - - - 10 11
Total Duration - - - 6 56

And Remarks. This Tranſit happens about three Ho and half ſooner by *this* Calculation, than *Leadbetter* m it, in his Treatiſe of Eclipſes: And there he makes Lat. S. A. But as he calculated by *Aſtron. Carolina*, wh Tables are very ancient, and as the Place of the Sun Venus agree to 10″ with that of Dr. *Halley*; I apprehe the Time will agree very near with his, &c.

Mr. *Tho. Harris* favoured us alſo with Calculations at la of the great Lunar Eclipſe, and Tranſit of Venus; bu they came too late to be inſerted in full, can only obl him with an Abſtract, as follows:

While *Tellus* thro' her annual Orb does run,
Four Times pale *Phœbe* will eclipſe the Sun;
And twice the Moon in Darkneſs will be found
As thro' her Orb ſhe runs her *menſtrual* Round:
If you the Times of each would truly know,
Obſerve the Computations here below.

1. The Sun eclipſed *May* 4, about ¾ paſt 5 Aft. Vertical Lat. 16° N. Long. 86° W. viſible in *S. America*, but invi here, by reaſon of the Moon's great S. Lat.

2. The ſecond a viſible and total Eclipſe of the Mo Beginning at *Bugbrook*, *May* 18d 8h 28′ 17″. Middle at 1 23′ 42″. Ends at 12h 19′ 7″. Duration 3h 50′ 50″. Dig 180 5′ 12″.

3. The Sun eclipſed *June* 3, at half paſt 1 in the Morn Vertical in Lat. 22° N. Long. 158° E. Viſible in the Eaſt Ocean, &c.

4. The Sun eclipſed *Oct.* 27, at half paſt 10 at N. Verti to Lat. 13° S. Long. 157° W. viſib. to the great So. Sea, &

5 The Moon eclipſed, *Nov.* 12, near Noon inviſible.

6. The Sun eclipſed ¼ paſt 2. Aft. on the 26 *Nov.* invi here, by reaſon of the Moon's great So. Latitude.

Mr. *Harris* makes the Tranſit of Venus to begin at *B brook*. *June* 6d 2h 59′ 53″. Middle 5h 18′ 38″. End 39′ 6″. From Sun riſe to laſt Contact 4h 54′ 51″. And th total Duration 6h 39′ 13″.

Answe

Answers to the Questions in the last Year's Diary.

(1.) Quest. 201, answered by Mr. *Tho. Barnett*.

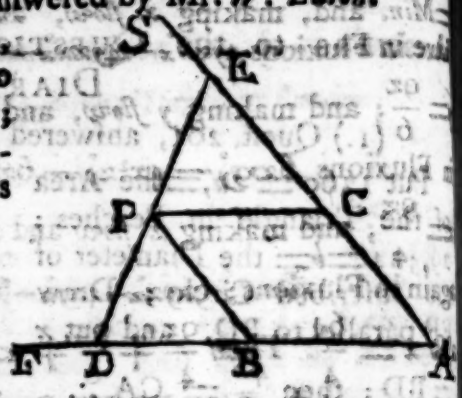
Put $1360 = 2a$, = the Area of the Triangle in Perches; $29,424 = b$ = the Diameter of the inscribed Circle; Draw EF parallel to BD, and put x = BD; then $\frac{4a}{x}$ = CA ∴ $\frac{4a-bx}{x}$ = AO; and by similar Triangles, as $\frac{4a}{x} : x :: \frac{4a-bx}{x} : \frac{4ax-bx^2}{4a}$ = EF. Therefore $\frac{4ax-bx^2}{4a} = b^2$, which, brought out of Fractions, and properly reduced, gives $x^3 - 92,44x^2 = -800332,27$. By converging Series, x is found = 38,5296 = BD; and 70,566 = AC. Then (by *Trig.*) I find the ∠A = 15° 16 and the ∠B = ∠D = 74° 44′.

The same answered by Mr. *Tho. Bramley*.

Put the Area of the given Triangle = 1360 sq. Perches = a; Area of the inscribed Circle = 680; then Radius will be = 14,712247 = b; (by *Simpson's* Algebra, p. 273) $\frac{a}{c} = 92,44 = c$ = half Sum of three Sides; because it is an Isosceles Triangle, put x = half Base, and each Side will be $c - x$; (then by 47 *Euclid*, 1.) the perpend. is = $\sqrt{cc - 2cx + xx}$; and Area a = $x\sqrt{cc - 2cx} = a$; reduced gives $\frac{-x^3 + cxx}{2c} = \frac{aa}{2c}$: Solved x = 19,2654072, whence the Base = 38,530144; each Side = 73,174928 vertex Angle = 30° 32′ Angles at the Base = 74° 44′ each.

Messrs. *Barker*, *Brown*, *Buddles*, *Croome*, *Drury*, *Eaton*, *Embleton*, *Foster*, *Kingston*, *Meshan*, *Robinson*, *Rowe*, *Scott*, *Thompson*, and others, sent Solutions to this Question, which we must omit inserting for the Sake of Brevity.

(2) Queſt. 202, anſwered by Mr. *W. Eaton.*



Make PB parallel to AS, $=a$; and PC parallel to AF, $=b$; and let BD$=x$; then by reaſon of the parallel Lines, it will be, as $x : a :: b : \frac{ab}{x} =$ CE; therefore AD$+$AE$=b+x+a+\frac{ab}{x}$ a *Minimum*, whoſe Fluxion is $\dot{x}\ \frac{-ab\dot{x}}{x^2} = 0$. Therefore $x^2 = ab$; that is as $a : x :: x : b$. Whence the Poſition of DE is known. Q. E. I.

The ſame anſwered by Mr. *W. Embleton.*

Let P be the given Point (ſee laſt Fig.) and EA, AD the Lines given in Poſition. Make PB parallel to EA$=a$, and PC parallel to DA$=b$, and put DB$=x$; then by reaſon of the parallel Lines $x : a :: b : \frac{ba}{x} =$ EC. Therefore DA $+$ EA$=b+x+a+\frac{ba}{x}$ which by the Problem is a *Minimum*, whoſe Fluxion $\dot{x}\ \frac{-ba\dot{x}}{x^2} = 0$. Which reduced gives $x = \sqrt{ba}$ whence the Poſition of DE is known. Q. E. I.

Meſſrs. *Bramley, Brown, Buddle, Drury, Kingſton, Robinſon, Thompſon,* and others, favoured us with good Solutions to the above.

(3) Queſt. 203, anſwered by Mr. *W. Kingſton.*

Let x=thoſe at 9 Shillings, y=thoſe at 4 Shillings; a=171, $a-x-y$=thoſe at 6 Shillings; then $6a-6x-6y+9x+4y=6a-2y+3x$, a *Maximum*, and in Fluxions is $3\dot{x}-2\dot{y}=0$. $\therefore 3\dot{x}=2\dot{y}$ $\therefore 3x=2y$; and by the ſame we gain thoſe of 6 Shillings $= \frac{9x}{4}$ whence $x+\frac{3x}{2}+\frac{9x}{4}=a$ $\therefore 4a=19x$, $\therefore x=\frac{4a}{19}=36$; $\frac{3x}{2}=54$; $\frac{9x}{4}=81$. And the whole Money 51*l.* 6*s.*

The ſame anſwered by Mr. *Tim. Drury*, the Propoſer.

Let x, y, and z=Number of each Sort; then $\frac{4x+6y+9z}{xyz} =$ Min

Min. and, making x *flow*, and y and z *conſtant*; we ave in Fluxions $4yzx\dot{x} - 4yzx\dot{x} - 6y^2z\dot{x} - 9yz^2\dot{x} = 0$. Hence $= \frac{9z}{6}$; and making y *flow*, and x and z *conſtant*, we have Fluxions $6zxy\dot{y} - 4x^2z\dot{y} - 6zxy\dot{y} - 9xz^2\dot{y} = 0$. Hence $= \frac{9z}{4}$; and making z *flow* and x and y *conſtant*; we have gain in Fluxions; $9xyz\dot{z} - 4xy\dot{z} - 6xy^2\dot{z} - 9xyz\dot{z} = 0$. Hence ſo $x = \frac{6y}{4}$. Then $\frac{9z}{4} + \frac{9z}{6} + x = 171$. Whence $z = 36$, $= 54$, and $x = 81$. W. W. R.

We received other Solutions to this Queſtion, which for revity's Sake we omit publiſhing, and proceed to the So- ution of

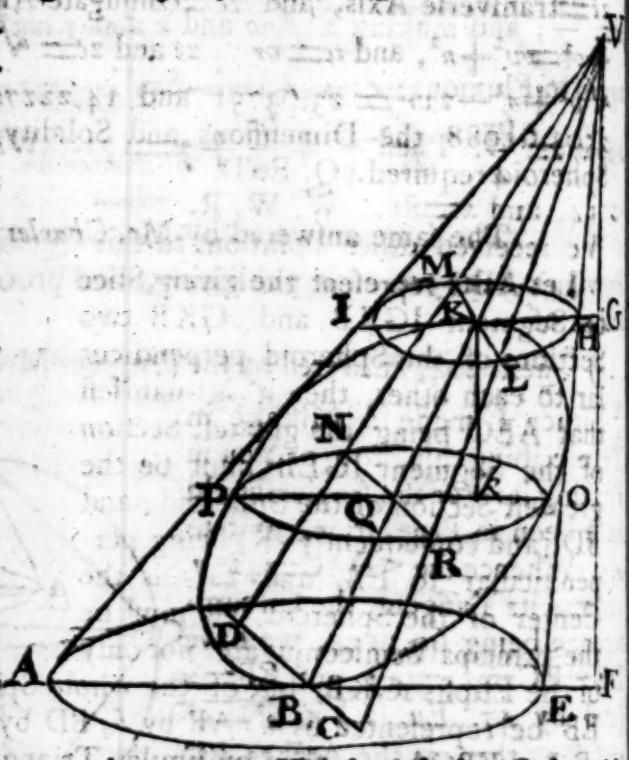
(4) Queſt. 204, anſwered by the Propoſer Mr. *W. Kingſton*.

Either I made a Miſtake in ranſcribing this Prob. or You in rinting it: For the Angles ſhould ave been in Proportion, as 5 to ,4. Whence the $\angle DAC = 42° 7'$ o $= d$ its Tangent, the Circum- erence being 69,1152, we have DE = EC = 11 = a; put EF = x and by 47. Eu. 1.) $\sqrt{a^2 - x^2}$ = CF; then as the Arches BC nd DC are equal; and the Sine f any Arch being equal to half he Chord of double the ſaid Arch; we have $2\sqrt{a^2 - x^2} = BD$, and by ſimilar Triangles, as $2a$ $2\sqrt{a^2 - x^2} :: 2\sqrt{a^2 - x^2} : \frac{2a^2 - 2x^2}{a} = AD$; whence AF $= \frac{2a^2 - 2x^2}{a} - a + x = \frac{a^2 + ax - 2x^2}{a}$. And as $1 : d ::$ $\frac{a^2 + ax - 2x^2}{a} : \sqrt{a^2 - x^2}$ $\therefore d \times \frac{a^2 + ax - 2x^2}{a} = \sqrt{a^2 - x^2}$ $\therefore d^2 \times a^4 + 2a^3x - 3a^2x^2 - 4ax^3 + 4x^4 = a^4 - a^2x^2$ $\therefore x^4 - ax^3 - \frac{3a^2x^2}{4} + \frac{a^2x^2}{4d^2} + \frac{a^3x}{2} = \frac{a^4}{4d^2} - \frac{a^4}{4}$ Solved, gives x $= 1,4312$, whence CF = 10,9065. AD = 21,6275, and AE = 10,6275.

Upon

Upon Account of the above Miſtake (made by the Propoſer) we have no true Solution to this Queſtion; ſeveral Contributors finding it impoſſible, according to the Data given, &c. Therefore ſhall give the Solution to

(5) Queſt. 205, by Mr. *George Brown*.



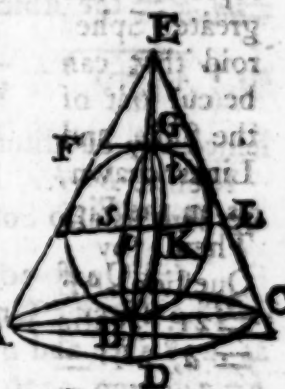
Let AVE repreſent the given Slice, VF its perpendicular Height; & let BPKOB repreſent the greateſt Spheroid that can be cut out of the Slice, and Lines drawn, as in the Fig. Then (by Queſtion AE $=21.133265=a$, VF $=44,994988=p$; BD $=$ BC $=m$; BE $=z$; AR $=v$; VG $=x$; then $p-x=$Height of the Spheroid.

And by ſim. Triangles VF : AE :: VG : HI $=\frac{ax}{p}$ and AE : AB :: HI : KH $=\frac{vx}{p}$ then will IK $=\frac{zx}{p}$; and AB $\times$ IK $=$ PQ^2 $=\frac{vzx}{p}$; and PQ $=\sqrt{\frac{vzx}{p}}$. Again, as VF : BC :: VG : KL $=\frac{mx}{p}$; and BC $\times$ KL $=$ QR^2 $=\frac{m^2x}{p}$, and QR $=m\sqrt{\frac{x}{p}}$ $\therefore$ PO $\times$ NR $\times$,785398 $\times\frac{2}{3}$ GF $=\frac{1}{3}$ $\times$,785398 $\times\sqrt{\frac{vzm^2x^2}{p^2}}\times p-x=$Solidity of the Spheroid BPKOB, which by Queſt. muſt be a Maximum, or $px-x^2$ a Maximum; put into Fluxions, &c. $x=\frac{1}{2}p$. Now to determine v and z in the Maximum make z *flow*, then $ax-z^2$

put

put into Fluxions, &c. $\dot{x}=\dot{z}$; which being ſubſtituted in $v=a-x$ gives $v=\frac{a}{2}$ ∴ $x=o$. i. e. AB=BC=$\frac{1}{2}$AE: Now by having given the two Conjugates PO and KB and the ∠ Kk, to find the two principal Diameters: Put PQ=7,471729=v, KQ=11,594304=n, Kk=11,248747=r; $2t$=tranſverſe Axis, and $2c$=conjugate Axis; then will $t^2+c^2=v^2+n^2$, and $tc=vr$ ∴ $2t$ and $2c=\sqrt{v^2+n^2+2vr}+\sqrt{v^2+n^2-2vr}$ = 23,63751 and 14,222748, Solidity = 2503,61988 the Dimenſions and Solidity of the greateſt Spheroid required. Q. E. D.

The ſame anſwered by Mr. *Charles Wildbore*.



Let AEC repreſent the given Slice or Segment IGKB and ſGKB two Sections of the Spheroid perpendicular to each other, then it is manifeſt that AEC being the greateſt Section of the Segment IGLB muſt be the greateſt Section of the Spheroid; and BD (and conſequently eK) being perpendicular to EB, and as e is the Center of the Spheroid, eK muſt be the principal Semiconjugate, not only of the Eliplis ſGKB, but of the whole Spheroid: Now let EB be repreſented by a, AB by b, BD by c, Gb by x, and ſeL=EBC by s; then by ſimilar Triangles $a:b::a-x:\frac{b\times a-x}{a}$=FG; but by the Property of the Eliplis FG × AB=$\frac{Ie^2}{a}$, whence $Ie=b\sqrt{\frac{a-x}{a}}$; and in the ſame Manner it is found that $e\sqrt{\frac{a-x}{a}}=eK$; but it is likewiſe known that $\frac{s\times IL\times GB}{2eK}=\frac{sbx}{c}$ is the principal Tranſverſe of the Spheroid, which, multiplied by the Square of the Conjugate, is to be a Maximum, repreſented by $sbx\times a-x$; whence $x=\frac{1}{3}a$=23,1886, which gives the Solidity 2503,59.

(6) Queſt. 206, anſwered by Mr. *Tho. Allen*.

Put the convex Superficies 6980,58996=s; 2,6044=a, Abſciſſa=x; and Ordinate (by Queſt.)=,6x. Then will

$\sqrt{4,36 \times x + 36xx} \times ,6ax = vs$; or $\sqrt{4,36 \times ,6x^2 + x\sqrt{436 + ,6x}}$

$\frac{,216x^2}{\sqrt{4,36 + ,6}} = \frac{s}{a}$ Where $x =$

$\sqrt{a \times \sqrt{4,36 \times ,36 + \frac{,216}{\sqrt{4,36 + ,6}}}} = 50$. Whence the Ordinate $= 30$.

The same answered by Mr. *Tho. Crabtree*.

Put 6980,58996 $= a$, the given Ratio as p to q; 2,0944 $= m$, $x =$ the Abscissa, and $y =$ the Semiordinate. Then

$my\sqrt{4x^2 + y^2} - \frac{my^3}{\sqrt{4x^2 + y^2} + y} = a$; and $py = qx$ $\therefore x = \frac{py}{q}$

hence, by Substitution and Reduction, $y = 30$, and $x = 50$.

Messrs. *Barker*, *Barnett*, *Brown*, *Embleton*, *Rowe*, *Scott*, &c. sent us also Solutions to the same Question.

(7) Quest. 207, answered by Mr. *John Goodhead*.

The specific Gravities of *Cork*, *Water*, and *Copper*, are as ,238; 1; and 9: which let be as s, l, and c; put $a = 18$; $b = 24$; $m = ,5236$; $n = 5787 =$ the Weight of a cubic Inch of Water: and $x =$ the Globes Diameter; then $m \times \overline{x^3 - b^3} =$ the Solidity of the Copper, and $mcn \times \overline{x^3 - b^3} =$ its Weight; $ma^3 =$ the Solidity of the Cork, and $smna^3 =$ its Weight: Consequently $smna^3 \times cmn \times \overline{x^3 - b^3} = lmn \times \frac{2a^3 + 2x^3}{3}$; whence by Reduction $x = \sqrt[3]{\frac{3b^3c + 2a^3l - 2a^3s}{c - l} \times 3}$ $= 25,127$; and the Thickness of the Mettle $= ,5635$ Inches.

The same answered by Mr. *John Hudson*, the Proposer.

Put $a = 24$, $b = 18$ Inches, $c = 5,2083 =$ Weight of a cubic Inch of Copper (Avoir) $d = ,5787 =$ that of Water, $n = ,13773 =$ Weight of a cubic Inch of Cork; $p = ,5236$, and $\frac{1}{2}x =$ Thickness of the Copper, then will $a + x =$ the whole Axis of the concave Globe; $\overline{3a^2 + 3ax^2 + x^3} \times pc =$ Weight of the Globe of Copper; and $\overline{a^3 + 3a^2x + 3ax^2 + x^3} \times pd =$ the Weight of the Water dislodged by it; also $pnb^3 =$ Weight of the Cork, and $\frac{2}{3}dpb^3 =$ Weight of the Water dislodged

Iſſlodged by it (by Queſtion) $\therefore \overline{3a^2x+3ax^2+x^3} \times pc-$
$\overline{3+3a^2x+3ax^2+x^3} \times pd=\frac{2}{3}\ pdb^3+pnb^3$: Hence x^3+
$2x^2+1728x=2040,498$. Which ſolved gives $x=1,18$
ery near $\therefore$ the Thickneſs of the Copper is ,59 Inches.

The ſame anſwered by Mr. *George Brown*.

Put $d=18$ Inches, the Diameter of the Globe of Cork;
$=24$ Inches, the inſide Diameter of the Globe of Copper,
ts whole Diameter $=x$; $p=,5236$, $D=,238$ ſpecific Gra-
ity of Cork; $f=9$ ſpecific Gravity of Copper, $e=1$ d°. of
ommon Water; $n=,5275$ Ounces *Troy*, or, 5787 oz.
d-verdup. by *Emerſon's* Mech. 2d Ed. Then $pd^3=$ſolid In-
hes in the Globe of Cork; and by Queſt. $\frac{2}{3}pd^3=$Cork im-
merged; $px^3-pb^3=$ ſolid Inches of Copper, and $p\times\frac{2}{3}$
$d^3+x^3=$ſolid Inches of Water, as big as the Parts im-
merged, which muſt be equal to the Weight of the two
Globes (by *Emerſon*) And $nep\times\frac{2}{3}d^3+x^3$ Ounces$=$Weight
of the Water, alſo $\overline{nDpd^3}$ Ounces$=$Weight of the Globe of
Cork; and $\overline{nfp\times x^3-b^3}$ Ounces$=$Weight of Copper $\therefore$
$\overline{nDpd^3}+\overline{nfp\times x^3-b^3}=nep\times\frac{2}{3}d^3+x^3$, and $x=$
$\left|\frac{\overline{fb^3+ze-3D}\times d^3}{3\times f-e}\right|^{\frac{1}{3}}=25,12708$ Inches, and the required
Thickneſs of the Metal$=,56354$ decimal Parts of an Inch.

(8) Queſt. 208, anſwered by Mr. *John Thompſon*.

Put $150=s$; $18=d$; AB—BC$=z$
and AC$=x$. Then as $x:s::z:d$ $\therefore$

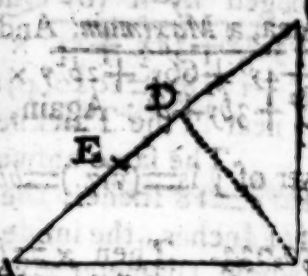
$z=\frac{dx}{s}$; and $\frac{x}{2}+\frac{d}{2}=$AD; alſo $\frac{x}{2}+$
$\frac{z}{2}=$AB. And (by 47. eu. 1.)
$\overline{\frac{s+x}{4}^2}-\overline{\frac{x+d}{4}^2}=BD^2=\overline{\frac{s+dx}{s}^2}-\overline{\frac{x+d}{4}^2}\times d$ by x^2 gives
$\overline{\frac{s+dx}{s}^2}-\overline{\frac{x+d}{4}^2}\times x^2=a$ Max. really divided, &c. we'ſe
$s^4x^2+d^2x^4-s^2x^4-d^2s^2x^2$ a Max. which, fluxed and re-
duced, gives $x=\sqrt{\frac{1}{2}}=106,0659$, from which is eaſily
found AB$=81,3639$ BD$=52,6498$ and BC$=68,636$.

W. W. R.

The

The ſame anſwered by Mr. *W. Eaton*.

Every one that has but ſmall Knowledge in *Fluxions*, muſt know that the Triangle is a rectangled one: Therefore, let ABC be the Triangle, and AB+BC=150=S; and DF=18=*d*, and *s*=Half the Sum of the Angles BAC+BCA=45°. Then (by a Theorem in *Thacker*) we have $S : d :: s : \frac{ds}{S}$ = the natural Sine of 4° 52′ 8″ Half the Difference of the ſaid Angles; hence the Angle BAC=40° 7′ 52″, and BCA=49° 52′ 8″, from whence the Sides of the Triangle are found (viz.) the Side AB=81,386, BC=68,614; and AC=106,45. Q. E. I.



Mr. *J. Holroyd* anſwers the ſame as follows:

Put *a*=150=AB+BC, and *e*=18=the Difference of the Segments of the Baſe (ſee Mr. *Thompſon's* Fig.) alſo let *x*=AC=the Baſe, and *z*=the Difference of the Sides: Then by *Trigon.* we have $x : a :: z : e \therefore xe = za$; hence $z = \frac{xe}{a}$, and alſo $\frac{a^2+xe}{2a}$=AB; or $\frac{a^4+2a^2xe+x^2e^2}{4a^2}$=$\overline{AB}^2$; and likewiſe $\frac{x+e}{2}$=AD, or $\frac{x^2+2xe+e^2}{4}$=$\overline{AD}^2$; then (by 47. E. 1.) $\sqrt{\frac{a^4+x^2e^2-a^2x^2-a^2e^2}{4a^2}}$=DB. Put $n=a^4-a^2e^2$, and *x* by $\frac{1}{2}x$ we have $\sqrt{\frac{nx^2-a^2x^4+e^2x^4}{16a^2}}$= the Area, a Max. which, put in Fluxions, and reduced, gives $\dot{x}=\sqrt{\frac{n}{2a^2-2e^2}}$, or $x=\sqrt{\frac{1}{2}}a$=106,06=the Baſe; hence AB=81,363, and BC=68,636. Q. E. I.

Mr. *Barker*, the Propoſer, gives the Solution thus:

Put 2*a*=150, 2*b*=18, 2*x*=Difference of the Sides, 2*y*=the Baſe: Then by a well known Theorem, as $y : a :: x : b, \therefore x = \frac{by}{a}$ (or by putting $c=\frac{b}{a}$) we have $x=cy$; again (by 47. 1. Eu.) $\sqrt{a^2+x^2}-y+b^2$ = CD (ſee Mr. *Thompſon's* Fig.) then by multiplying the laſt Equation by *y*, and

nd ſubſtituting the Value of x, we have $y\sqrt{a+cy)^2-q+b^2}$ = Area, a *Maximum*. And in Fluxions is $2a^2y+6acy^2+4c^2y^3$ $\dot{y}-4y^3+66y^2+2b^2y\times\dot{y}=0$. Whence $a^2+3acy+2c^2y^2$ $=2y^2+3by+b^2$: Again, ſeeing the Coefficient of the loweſt power of y is $=$ (viz.) $=bb$ we have therefore $y\sqrt{\frac{a^2-b^2}{1-c^2}}\times 2$ $=50,033$. Then $x=6,36396$. AB $=106,066$ AC $=1,36396$; and BC $=68,93604$: Conſequently the Area $=\frac{a}{7}\,\frac{r}{1}\,\frac{p}{32}$, &c.

(9) Queſtion 209, anſwered by Mr. *Tho. Allen*.

Put the Sine of CAB $=50°=a$, Rad. $=1$; b and c for the Sines and Coſines of $\angle$D (ſee Fig. in laſt Year's Diary) $=25°$; alſo let DC $=100=d$, and DB $=x$: Then by Trigonometry $a:x::\frac{bx}{a}=$AB; and $\sqrt{d^2-2dcx+xx}=$BC. Therefore by Queſtion $\frac{-dc\dot{x}+x\dot{x}}{\sqrt{d^2-2dcx+xx}}+\frac{b\dot{x}}{a}=0$. $\therefore dc-x=\frac{b\sqrt{d^2-2dcx+xx}}{a}$ ſolved, $x=62,684$. Whence the Point B is determined Q. E. F.

Mr. *Thomas Barker* anſwers the ſame as under.

Put a, and b, $=$ natural Sine and Coſine of the $\angle$D (ſee the Author's Fig.) $c=$that of the Angle DAB $=$BAC $=50°$. $d=100=$DC, and $x=$ natural Sine of the Angle DBC; Then $\frac{ad}{x}=$BC. Whence as $c:\frac{ad}{x}::bx-a\sqrt{r^2-x^2}:$ $\frac{abdx-a^2d\sqrt{r^2-x^2}}{cx}=$AC ($r$ being $=$ Radius, and $bx-a\sqrt{r^2-x^2}$ the Sine of the Angle ABC) Whence $\frac{ad}{x}+d-\frac{abdx-a^2d\sqrt{r^2-x^2}}{cx}=$ a Minimum. In Fluxions gives $\frac{-a\dot{x}}{x^2}+\frac{a\dot{x}}{rc\sqrt{r^2-x^2}}+\frac{a\dot{x}\sqrt{r^2-x^2}}{rcx^2}=0$. Solved gives $x=\frac{r}{\sqrt{c^2-a^2}}=,83404=$natural Sine of $56°\ 31'$. or (rather) $123°\ 29'=\angle$DBC; whence ABC $=98°\ 29'$. then BC $=50,67$ nearly, AC $=65,42$; then AD $=$AB $=34,58$, and the Sum of AB $+$ BC $=85\frac{1}{4}$.

Anſwered

Answered also by Mr. *George Brown* (see same Fig.)

Put DC=100=a, m and n=Sine and Cosine $\angle D$=45°, p=Sine $\angle CAB$=50° by Quest. x and y=Sine and Cosine $\angle DCB$. Rad.=1. Then will $nx+my$=Sine $\angle DBC$, and by Trigonometry $BC=\frac{am}{nx+my}$; $BA=\frac{1}{p}\times\frac{amx}{nx+my}$; and $BA+BC=\frac{am}{p}\times\frac{p+x}{nx+my}$; which, by Quest. must be a Minimum; or $\frac{p+x}{nx+my}$ a Minimum: Put into Fluxions and reduced, $ny-mx=\frac{m}{p}=,5516890$, answering to the Cosine of 56° 31′=Cosine $\angle DBC$, which being taken from 180°. we have 123° 29=$\angle DBC$; consequently the $\angle DCB$=31° 31′, and DB=62,6759, the required Point B. Q. E. D.

(10) Quest. 210, answered by *Tabularius*, the Proposer.

Let E, F, G, H, be the four given Points, and put EF=a, FG=b, EH=c; p and $\pm q$=Sine and Cosine $\angle EFG$; r and $\pm s$,=Sine and Cos. $\angle FEH$ and x and y= Sine and Cosine $\angle AEF$; then will $py\pm qx$=Sine $\angle BGF$, and $rx\pm sy$ Sine $\angle DHE$. By Trigonometry, Radius =1 : a : : x : ax (=AF) : : y : ay=AE; also 1 : b : : $py\pm qx$: $b\times py\pm qx$ =BF; and 1 : c : : $rx\pm sy$: $c\times rx\pm sy$=DE, $\therefore ax+b\times py\pm qx$=AB=DC, and $ay+c\times rx\pm sy$=AD=BC; from which $ax+bpy\pm bqx\times ay+crx+csy=a^2\pm abq+bcpr\pm acs+bcqs\,(d)\times xy+abp\pm bcps\,(m)\times y^2+acr\pm bcqr\,(n)\times x^2$ is a Maximum, and $dyx+dxy+2nxx=0$; but $\dot{y}=\frac{-x\dot{x}}{y}$ $\therefore dy\dot{x}-\frac{dx^2\dot{x}}{y}-2x\dot{x}\times m-n=0$;

Whence $d\times y^2-x^2=2xy\times m-n$, and thence $\frac{2xy}{y^2-x^2}=\frac{d}{m-n}$ = Tangent of double the $\angle AEF$, which Angle, therefore, will be greater, equal to, or less than 45°; according as n is greater, equal to, or less than m.

(11) Quest.

(11) Queſt. 211, anſwered by Mr. *George Brown*.

Put s=9000*l.* a=1,00093614 the Amount of 1*l.* in one Week; b=2*l.*=Money put out at Intereſt the firſt Week; c=1*l.*=Money to be taken from the firſt Week's Amount; n=required Number of Weeks. Then $1l. : a :: b : ab$=Amount at the End of the firſt Week, and Principal=$ab-c$; and by Queſt. $ab-c+b^2$=Principal to run on at Intereſt the ſecond Week; then will $a^2b-ac+ab^2$=Amount at the End of the ſecond Week; and by Queſt. $a^2b-ac+ab^2-2c-b^3$=Principal to run on at Intereſt the third Week; conſequently the Principal to run on at Intereſt the ninth Week, $ba^n-ca^{n-1}+b^2a^{n-1}-2ca^{n-2}+b^3a^{n-2}-3ca^{n-3}-b^4a^{n-3}-4ca^{n-4}+b^5a^{n-4}-5ca^{n-5}+b^5a^{n-5}$ continued to $n-1$ Terms,

$$nc+b^{1+n}=\begin{cases} ba^n,-ca^n\times\frac{1}{a}+\frac{2}{a^2}+\frac{3}{a^3}+\frac{4}{a^4}\text{ continued to }n-1\text{ Terms},-nc, \\ +ba^n\times\frac{b}{a}+\frac{b^2}{a^2}+\frac{b^3}{a^3}+\frac{b^4}{a^4}\text{ continued to }n-1\text{ Terms}+b^{1+n} \end{cases}$$

The firſt Series being compared with Prob. 4. N°. 2. *Turner's* Math. Exerciſes its Sum will be $\frac{c\times a^{1+n}-a\times na-n+1}{a-1^2}$

and the Sum of the ſecond Series is $\frac{ab^{1+n}-b^2a^n}{b-a^2}$ $\therefore$ $ba^n-\frac{c\times a^{1+n}-a\times na-n+1}{a-1^2}+\frac{ab^{1+n}-b^2a^n}{b+a}-nc+b^{1+n}=s$.

Put into Numbers and ſolved n=19,15284 the required Number of Weeks.

The ſame anſwered by Mr. *Todd*, of *Weſt-Smithfield, London*.

If a=2*l.* s=9000*l.* r=1,05$\frac{1}{32}$=1 Pound and its Inteſt for 1 Week; and n=the Number of Weeks. Then

will $\begin{cases} ar-1=\text{Sum at Intereſt the End of 1ſt Week.} \\ a^2r+ar^2-r-2=\text{D° of 2d D°.} \\ a^3r+a^2r^2+ar^3-r^2-2r-3=\text{D° of 3d D°.} \\ a^4r+a^3r^2+a^2r^3+ar^4-r^3-2r^2-3r-4=\text{D° of 4th D°} \end{cases}$

and $ra^n+r^2a^{n-1}+r^3a^{n-2}+r^4a^{n-3}$ &c. $a^1r^{n-2}+a^2r^{n-1}+a^nr^{n-1}-2r^{n-2}-3r^{n-3}$ &c. $\frac{r^{n+2}\times r^2-n+1\times r}{r-1^2}$

C

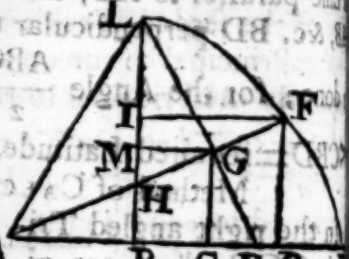
$L_n = \frac{ra}{a-r} \times a^{n-r^n} - \frac{r^{n+1}+r}{(r-1)^2} + \frac{nr}{r-1} - n = s$, by

Queſtion. Or, $\frac{ra}{a-r} \times a^{n-r^n} - \frac{r^{n+1}+r}{(r-1)^2} + \frac{n}{r-1} = s$

From whence the Value of n may be found.

(12) Queſt. 212, anſwered by Mr. *John Goodhead*.

Draw MG parallel, and Fp perpendicular to AE; and put LI $= x$, IF $= y$ BL $= m$, and AB $=$ BD $= n$; then will BC $=$ GM $= \frac{y}{2}$ and by Sim. Triangles, as BD : BL :: GM : LM : that is, as $n : m :: \frac{y}{2} : \frac{my}{2n} =$ LM. Therefore $\frac{2mn-my}{2n} =$ BM $=$ GC; Again as AC $\left(\frac{2n+y}{2}\right)$: CG $\left(\frac{2mn-my}{2n}\right)$ :: Ap $(n+y$: Fp $=$ BI $= \frac{2mn^2-mny-my^2}{2n^2+ny}$.



Conſequently BL $-$ BI $=$ LI; that is $m - \frac{2mn^2-mny+my^2}{2n^2+ny} = x$. Therefore $\frac{my^2}{2n^2+ny} = x$. or $my^2 - nxy = 2n^2x$; the Equation of the Curve, an Hyperbola.

The ſame anſwered by Mr. *Zach. Gaſkell* the Propoſer.

Put LI $= x$ (ſee laſt Year's Fig.) IF $= y$; AB, or BD $=$ BL $= m$; Draw CG parallel to BL, then will BC $= \frac{y}{2}$ and by ſimilar Triangles, as $n : m :: n-y$: CG $= \frac{mn-\frac{1}{2}my}{n}$ and as $(n+\frac{1}{2}y)$: CG $:: n$: HB $= \frac{mn-\frac{1}{2}my}{n+\frac{1}{2}y}$. Again as AB : HB :: IF (y) : IH $= \frac{mny-\frac{1}{2}myy}{nn+\frac{1}{2}ny}$. Then will LB $-$ IH $-$ HB $= \frac{mny+myy}{n+\frac{1}{2}y} - my$. Reduced $\frac{2n}{m}x = yy$ whence the Curve is the common or *Appolonian* Parabola, whoſe Parameter $= \frac{AD}{LB}$.

I have turned over all my Books that treat on the *Conic Sections*, but find not the leaſt Hint of the above Property.

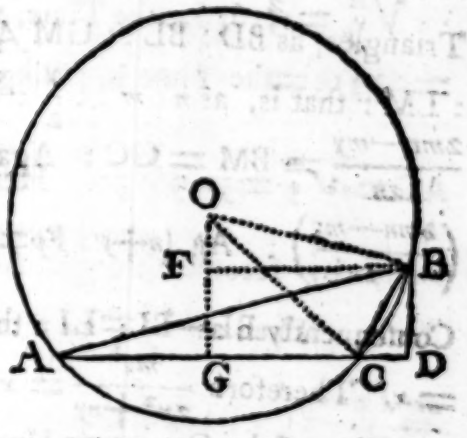
Method of conſtructing the Curve by Points, I think is erable (by its Simplicity) to any other Method, and I e I may juſtly claim it as mine own. *Zach. Gaſkell.*

(13) Queſt. 213, anſwered by Mr. *George Brown.*

Take AC=28 Feet, the tranſverſe Axis of the Curve, n which (by 33. Eu. 3.) deſcribe the Segment of a Cir- to contain 31° 50′ = twice the Sun's Declination, draw ine parallel to AC, and at the Diſtance of 16 Feet, join , &c. BD perpendicular to AC produced, and the Thing one; for the Angle $\frac{ABC}{2}$ or the Sun's Declination + CBD=required Latitude.

Method of CALCULATION.

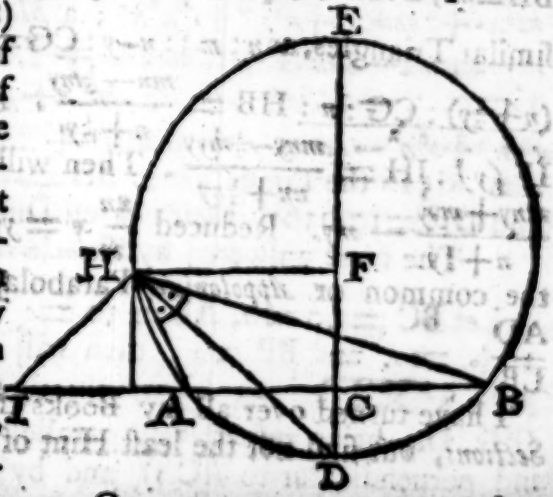
In the right angled Tri- gle OGC, there are gi- n the Angles and Side C; find GO = 22,5503 d OC=OB=26,54279; he right angled Triangle FO, there are given FO d OB, then (by 47. Eu. FB=GD=25,72182; the right angled Triangle DB, there are given CD d DB=19: find the An-



e CBD=36° 13′ 17″; ∴ $\frac{ABC}{2}$ + CBD=52° 8′ 17′ e required Latitude N. Q. E. D.

The ſame conſtructed by Mr. *Tho. Moſs*, the Propoſer.

Upon AB (=28) ſcribe a Segment of Circle capable of ntaining an Angle ual to twice the gi- n Declination: Let e Circle be complet- d, and Biſſect AB in , thro' which draw e Diameter DE, in hich take CF=16; raw FH parallel to B meeting the Peri-



phery of the Circle in H; join DH, and draw HI, perpendicular to DH meeting BA produced in I, and the Time is done, and the Angle BIH will expreſs the required Latitude.

(14) Queſt. 214, anſwered by Mr. *W. Kingſtom.*

Let $2a$=BC=60; a=AB=30; $d=16\frac{1}{12}$; s, and c, = Sine and Coſine of ACB=30°. as d : 1″ :: a : $\frac{a}{d}$ = the Square of the Time in falling thro' AB

$\therefore \sqrt{\frac{a}{d}}$=1,3656=the Time; and, as a : $2a$ :: $\sqrt{\frac{a}{d}}$: 2$\sqrt{\frac{a}{d}}$ =2,7312=the Time in falling through BC, by 47. Eu.

AC=$a\sqrt{3}$=51,96152. Hence $\frac{a\sqrt{3}}{2\sqrt{\frac{a}{d}}}$=19,023 the Velocity by ſecond through AC, Let x = the required Time. Then as $\frac{4a}{d}$: $2a$ :: x^2 : $\frac{dx^2}{2}=nx^2$. and CD=$\frac{ax\sqrt{3}}{2\sqrt{\frac{a}{d}}}=mx$; then, as 1 : mx :: s : smx=DG. Again as c : mx :: c : mcx=CG: hence $2a-cmx-nx^2$=GH, and 47. Eu. 1. $GH^2+DG^2=DH^2=4a^2-4acmx-4anx^2+m^2x^2+2cmnx^3+n^2x^4+s^2n^2x^2$; a *Maximum*, and in Fluxions is $-4acmx-8anx\dot{x}+6cmnx^2\dot{x}+2c^2m^2x\dot{x}+4n^2x^3\dot{x}+2s^2n^2x\dot{x}=0$. $\therefore 2acm-4anx+s^2n^2x+3cmnx^2+2n^2x^3=0$. $\overline{c^2m^2+s^2n^2-4an}\times x+3cmnx^2+2n^2x^3=2acm$. Solved x=1,81526 the Time; hence BH=26,4986, DC=34,534 and DH=17,6361, their neareſt Diſtance.

The ſame anſwered by *Tabularius*, the Propoſer.

Let BC=60=a, AB=30=c, $16\frac{1}{12}$=s, and BP=x; then will AC=$\sqrt{a^2-c^2}$, PA=De=$c-x$ (PD, De, being reſpectively parallel and perpendicular to AC;) and by

lar Triangles $c : x :: \frac{ax}{c} = BD$, and $c : \sqrt{a^2-c^2} :: \frac{c-x \times \sqrt{a^2-c^2}}{c} = Ce$; also the Time of perpendicular

fcent, from B to A $= \sqrt{\frac{c}{s}}$, and from B to P $= \sqrt{\frac{x}{s}}$

by *Mechanics*, $c : a :: \sqrt{\frac{c}{s}} : \frac{a}{\sqrt{cs}} :: \sqrt{\frac{x}{s}} : \frac{a}{c} \times \sqrt{\frac{x}{s}}$

the Times of Decent along BC, and BD reſpectively:

w, by uniform Motion $\frac{a}{\sqrt{cs}} : \sqrt{a^2-c^2} :: \frac{a}{c} \times \sqrt{\frac{x}{s}} :$

$\frac{x \times \sqrt{a^2-c^2}}{c} = CE \therefore CE - Ce = Ee =$

$\frac{c-x-e-x \times \sqrt{a^2-c^2}}{c}$; but $\frac{\sqrt{a^2-c^2}}{c} =$ Tangent of

$\angle ABC (=t) \therefore \overline{DE}^2 = t^2 \times \overline{cx-2\sqrt{cx} \times c-x} + \overline{t^2+1} \times \overline{c-x^3}$, a *Minimum*; in Fluxions $t^2 \times \dot{cx} - \frac{c^2\dot{x}-3cx\dot{x}}{\sqrt{cx}} -$

$\overline{t^2+1} \times \overline{c-x} \times \dot{x} \times t^2+1 = 0. \therefore \frac{t^2c \times \overline{3x-c}}{\sqrt{cx}} = t^2c-2t^2x+2c-2x.$

ut $t^2+2=n$, and $2t^2+2=m$, then will $t^4c \times \overline{3x-c}^2 = x \overline{nc-mx}^2$, and by Reduction (putting $cv=x$) $v^3 -$

$\frac{t^4+2mn \times v^2 + \overline{6t^4+n^2} \times v - t^4}{m^3} = 0$. In Numbers $v^3 -$

$515625v^2 + 1,234375 = ,140625$, from which $v = 441645$,

$x = 13,24935$, and thence $DE = 17,63635$.

The ſame anſwered by Mr. *J. Holroyd*.

In the Triangle ABC (ſee laſt Fig.) put $x = 60 = CB$, nd $n = 51,9615 = CA$; alſo let $t = 2,73$ ſeconds the Time n which the Body deſcends down BC; and let $z =$ the ime that the Body will deſcend down from B to D, and hat another Body will move from C to E at an uniform Rate: Then by the Law of deſcending Bodies, we have

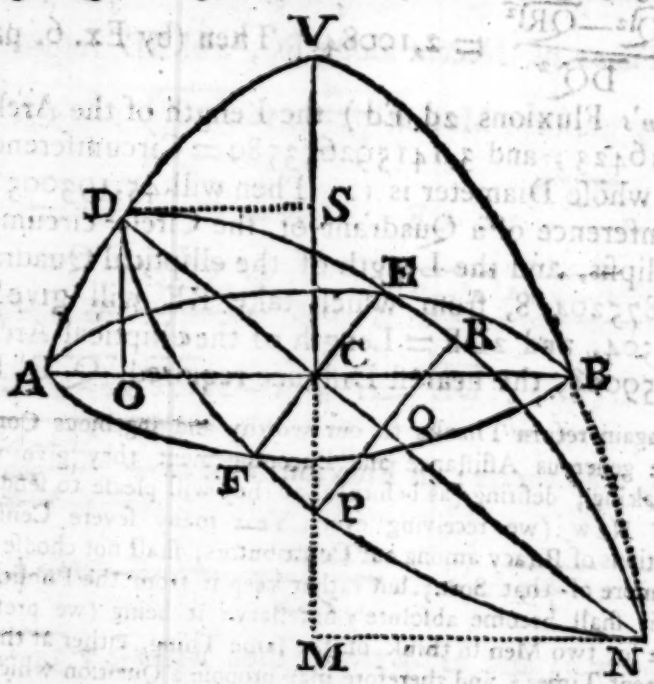
$n^2 : x :: a^2 : \frac{a^2x}{t} = BD \therefore \frac{t^2x-a^2z}{t^2} = CD$; alſo $t : n ::$

$a :$

$a : \frac{na}{t} = CE$. Hence by Queſt. $\frac{na}{t} = \frac{t^2z - za^2}{t^2}$;
$na = \frac{t^2z - za^2}{t}$ Ergo. $tna = t^2z - za^2$, or $za^2 + tna =$

hence $a = 1,7927$, wherefore CD is found $= 34,127$, a
alſo DE $= 17,663 =$ the Diſtance required.

(15) Queſt. 215, anſwered by Mr. *George Brown*.



Let AVB repreſent the given Parabolic-Conoid, wh
the Length of the Curve EDF is a *Minimum*, then will C
be ſo too, and the Curve EDF will be an Ellipſis,
Prob. 1. Pag. 49, *Royal Magazine*, for *Jan.* 1760.

Put VC $= 30 = a$, CA $=$ CB $= 25 = b$; VS $= x$, C
$= v$; then will $\overline{CD}^2 = \frac{b^2x}{a} + a - x^2$ a *Minimum*, put
to Fluxions, &c. $x = \frac{2a^2 - b^2}{2a}$ and CD $= \frac{b}{2a}\sqrt{4a^2 - b^2}$
$= 22,72648357$: Again DO : OC : : CM : MN $= \sqrt{2a^2 - b^2}$; and by Property of the Curve $\overline{MN}^2 =$
$\frac{2v^2}{b^2} \times 2a^2 - b^2$; $\therefore 2a \times 2a^2 - b^2 \times v^2 - b^4 v = b^4 x$;

$$\frac{b^2\sqrt{b^4+8a^2\times 2a^2-b^2}+b^4}{4a\times 2a^2-b^2} = \frac{750}{47} = 15,95744\,68$$

Then will $DN = DC \times \frac{DQ+CM}{DQ} = 57,54152223$, the Transverse Axis; and by Property of the Ellipsis $RP = 1,14130344$ the Conjugate Axis; then $CQ = 6,04427754$ and $\frac{DQ^2-QR^2}{DQ^2} = 2,10084$. Then (by Ex. 6. pag. 241 *Emerson's* Fluxions 2d Ed.) the Length of the Arch $RE = 1,08016423$; and $3,14159265358\,9$ = Circumference of a Circle whose Diameter is 1. Then will $45,1930058785$ = Circumference of a Quadrant of the Circle circumscribing the Ellipsis, and the Length of the elliptical Quadrant $DR = 41,87520428$, from which take RE will give $ED = 5,79504$, and $2DE$ = Length of the elliptical Arch EDF, $= 71,59008$, the nearest Distance required. Q. E. D.

We again return Thanks to our worthy and ingenious Contributors, for the generous Assistance and Encouragement they give us in this Undertaking; desiring (as before) that they will please to send us *Things* entirely New (we receiving every Year many severe Censures, and Accusations of Piracy among our Contributors, shall not choose to publish much more of that Sort; but rather keep it from the Publick; except when it shall become absolutely necessary: it being (we presume) very possible for two Men to think of the same Thing, either at the same, or at different Times; and therefore may propose a Question which they verily believe to be realy new and their own; when possibly, on Publication, the same may be found in some Author which the Proposer or Solver had never the Opportunity to see or consult) and also, that their Schemes may be drawn as perfect as possible, and of a proper Size; as well as bring out all Equations in Numbers, in order to facilitate the Labour of the Author's collecting and compiling the Work; and further (as several Letters come too late in every Year to be inserted, or even mentioned in the Catalogue) desire they will take Care for the future that they be sent soon enough to come to hand before the first Day of *May* in every Year, directed for the Authors of the *Gentleman's Diary*, to be left with *Tho. Peat*, Schoolmaster, in *Nottingham*. (Post paid)

And as the generality of our Contributors seem desirous to have a Prize-Question, and a Prize-Ænigma proposed, we being willing to oblige them in that respect; propose to give an annual Prize of twelve Diaries to such Contributor as shall favour us with the best Mathematical and Poetical Performances (sent in the time above limited) to be delivered to such Contributor the Christmas next following, as we shall order in the Diary; and accordingly desire, that Mr. GEO. BROWN Teacher of Mathematicks on *Portsmouth-Common*, will accept of twelve Diaries to be sent him as soon as published from *Stationers-Hall*, LONDON.

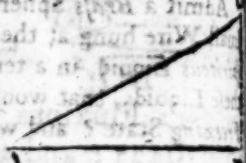
Nottingham, Aug. 1, 1760.

New Mathematical Questions proposed to be answered in the next Year's Diary.

(1) Queſt. 216, by Mr. *Thomas Harris* of *Bugbrook*.

In a right angled Triangle, there is given the Perpendicular = 30. It is required to find the Baſe and Area, when the Rectangle under the Difference of the Legs and Hypothenuſe is a *Maximum*?

(2) Queſt. 217, by Mr. *Thomas Barker*.



Suppoſe on AB the horizontal Line, a Cannon was diſcharged at A; it is required to find *how high* in the Air BC muſt be raiſed, that letting fall a Ball, it ſhall arrive at the Ground (B) the ſame Inſtant (of Time) the Sound arrives at C; but not till $\frac{4}{5}$ of a Second after the Sound arrives at B?

(3) Queſt. 218, by Mr. *Thomas Robinſon*, of *Biddick*.

Let there be a given Angle containing 30 Degrees. It is required to find, by a ſimple Equation, How many Degrees the given Angle muſt be encreaſed, when the Rectangle of the Sine and Coſine of their Sum is a *Maximum*?

(4) Queſt. 219, by Mr. *John Thompſon*, of *Witherly-Bridge*.

Required the Dimenſions and Solidity of the greateſt Fruſtrum of a Cone, that can be inſcribed in a Solid, generated by the Rotation of a Curve round its Axis, whoſe Abſciſſa is 40; bounding Ordinate 30, and Equation $px = y^4$?

(5) Queſt. 220, by Mr. *Henry Hogaddoe*.

As I was taking a Walk one Day, I obſerved the Flight of two Birds (viz. an *Hawk* and a *Swallow*) the *Hawk* appeared to *me* to deſcribe the Curve of an Ellipſis, whoſe conjugate Diameter is 50, and Area of its greateſt inſcribed Parallelogram 1700 Yards; alſo the apparent Curve that the *Swallow* deſcribed was that of the greateſt *Appolonian* Parabola, that could be inſcribed: Now, ſuppoſing that the *Hawk* flew at the Rate of 5 and the *Swallow* at 4 Yards per Second; it is required to find the Time they were in Motion in their *new Orbits*, with the Inveſtigation?

(6) Queſt. 221, by Mr. *Geo. Brown*, of *Portſmouth-Common*.

Suppoſe two right Cones, the Solidity and Superficies of each (including their Baſes) are all four equal; alſo the perpendicular Height of the *one* is equal to the ſlant Height of the *other*. Quere the Dimenſions of the two Cones?

(7) Queſt. 222, by Mr. *Charles Wildbore*.

It is propoſed to determine the Diameter of a Globe of Glaſs, half an Inch thick (whoſe Concavity is ſuppoſed to be void of Matter) that may carry a Man of ten Stone Weight, fixed at the loweſt Point of the Ball, through the Air, at the Height of half a Mile from the Surface of the Earth; allowing for the Decreaſe of the Air's Denſity; and that the ſpecifick Gravity of Air at the Surface, is to that of Glaſs, as, 000461 to 1.?

(8) Queſt.

(8) Queſt. 223, by Mr. *John Goodhead.*

Required two general Theorems (with their Inveſtigations) to determine the greateſt *Ellipſis* and *Spheroid*; that can poſſibly be inſcribed in a *Parabola* and *Paraboloid*, whoſe Abſciſſa is 30, and Semiordinate 23?

(9) Queſt. 224, by Mr. *Robert Waddington*, Mathematical Inſtrument Maker in *Hull.*

Admit a *Braſs* Sphere of 2 Inches Diameter, immerged in *Water* by a ſmall Wire hung at the End of a Balance (in like manner) immerged in a *Spiritous* Liquid, in a temperate State: Required the ſpecific Gravities of theſe Liquids, that would equilibrate the Balance with theſe Weights in a *Freezing* State? and when Boiling Heat?

(10) Queſt. 225, by Mr. *Charles Wilkinſon*, of *Spalding.*

In the Equation $\frac{y^2\dot{x}^2}{2b} - \dot{y}^2 - y\dot{x}^2 + \frac{\dot{x}^2y^2\ddot{y}}{\dot{y}^2} = 0$; to find the Value of x in Terms of y^2?

(11) Queſt. 226, by Mr. *Thomas Moſs*, of *London.*

At a certain Place, I obſerved a *Spire*, and a *May Pole*; the former (as I was informed) bore NE of the latter; and their Diſtance aſunder was 5 Miles; after I had travelled for ſome Time, in a right Line, I obſerved that I was 4 Miles from the *Spire*, and two Miles and a half from the *May-Pole*; and the Diſtance I had then travelled ſubtended an Angle at the *May-Pole* of 150: and proceeding forward ſtill in a Right Line, I found (by Obſervation) that the Diſtance from the Place of the *ſecond* Obſervation ſubtended an Angle at the *Spire*, of 280. And I was then told, that my Diſtance from the *Spire*, was three times of that from the *May-Pole*, at my *firſt* Obſervation; it is propoſed to find, by a *Geometrical Conſtruction*, the Diſtance, and in what Direction I travelled; from my *firſt* and *laſt* Obſervations?

(12) Queſt. 227, by Mr. *Thomas Allen*, of *Spalding.*

If a Curve, whoſe Equation is $ax = by + y^2$, be ſuppoſed to generate a Priſmatic Solid of a given Length, by a Motion of right Angles to it's Plane; and if this Solid move in an homogeneous Fluid, in Direction of the Abſciſſa of the generating Curve; it is propoſed to determine the Ratio of the Forces wherewith the Plane and Curve Superficies of ſuch a Solid are reſiſted by the ſaid Fluid?

(13) Queſt. 228, by Mr. *Charles Wildbore.*

The Breadth of a River, and its Depth from the Top of the Bank being given; it is propoſed to determine the *Form*, and *Poſition*, of a Pair of Sluice Gates, that ſhall reſiſt the Water, in every Point, with the greateſt Force poſſible?

The

ANSWERS to the ÆNIGMAS in last Year's DIARY.

1. CHARITY.

2. A Pair of PATTENS.
3. A GREAT COAT.
4. A VANE, or WEATHER-COCK.
5. A Scolding WIFE.
6. A POTATOE.
7. The MOON.
8. WANT.
9. SIR-LOYN of Beef.
10. WIT.
11. A FLEA.
12. A BED.
13. A GARTER.

Quære, by Mr. *Atkinſon*, a WOMAN; originally a SHADOW, and ſuch moſt of our Contributors anſwers it; but it was certainly Mr. *Atkinſon's own* Compoſition; and he expreſſes ſome Concern, having ſince found it not to be an Original; and therefore is in hopes the Publick will not cenſure him as a Plagiary, &c.

The BEGGAR'S WISH, containing *Anſwers* to all the laſt Year's *Ænigmas*, by Mr. *J. Atkinſon*.

Cælum ſtultitiâ petimus. Hor.

Grant, *Jove* benign! a Beggar's ardent Prayer,
Who ſolely truſts on thy paternal Care;
I aſk not Affluence, nor GARTERS crave, 13.
But BEEF, and 'TATOES, I would gladly have; 9, 6.
Chriſtmas to me's a faithful, conſtant Friend,
Preſerve its Cuſtoms, and its Rites defend:
(WITlings may ſneer; old Wives may SCOLD,—What then? 10.5.
Shall Heav'nly Rites be rul'd by ſinful Men?
But to return)—May I my *Satchell* fill
Before the MOON peeps o'er the Eaſtern Hill: 7.
May CHARITY, that's *warm*, adorn our Iſle, 1.
Plenty and Peace around *Britannia* ſmile!
May chryſtal *Fountains* (Health's Preſervers) flow
When I am *thirſty*, whereſoe'er I go:
And when bleak pregnant Storms, which VANES defy, 4.
May ſome warm *Cott* ſecure my *Fair* and I;
But (this deny'd) GREAT COAT and PATTENS grant; 3. 2.
A *Barn*, and FLEA-leſs BED is all we WANT: 11, 12. 8.
Thus let me paſs Life's tedious Hours away,
And Peace at laſt attend my final Day!

All the *Ænigmas* anſwered by *Un-qui-vive-la begattelle*.

Let ſome purſue the Trade of Arms,
And ſpend their Lives amidſt Alarms;
Make Earth their BED, and WANT ſuſtain; 12. 8.
By MOON-Light, Stars and GARTERS gain. 7. 13.
To ſhew their WIT, let Women SCOLD 10. 5.
About the idleſt Tale that's told;
And, while their *Theſis* is their Pride,
Sans CHARITY —— damn all beſide. 1.
While theſe graſp at the SHADOW Fame, Quære
Which (like a FLEA) oft 'ſcapes their Aim; 11.
In Solitude I ſpend my Days,
Of Cenſure mindleſs, as of Praiſe:

While

While Independence I poſſeſs,
I value not GREAT COAT, nor Dreſs! 3.
And can, without *Ragouts* and *Wine*,
On SIRLOIN and POTATOES dine. 9. 6.
I am unto no Rule confin'd,
Nor turn like VANE with ev'ry Wind: 4.
Books often read——and ſometimes *Men*,
And even *ſcribble* now and then;
UNCLOGG'D with Cares, and tho' exempt
From *Envy*, yet above Contempt. 2.

All the *Ænigmas* anſwered by Mr. *T. Beer*.

——— *Intacte Pallidis urbem,*
Carmine perpetuo celebrare—— Hor. Lib. 1. Ode 7.

Where *Cherwell's* pleaſant Streams meand'ring glide,
And *Iſis* gently laves her purling Tide;
Ye Sons of WIT, hail! hail that bleſs'd Retreat, 10.
Oxon, Parent of *Arts!*——The *Muſes* Seat!
Pleaſures unnumber'd ſtrike the raviſh'd Eyes,
And every View affords a freſh Surprize!
The ſtately Turrets, and high glittering VANES 4.
A ſplendid Proſpect give the neighb'ring Planes!
E'er *Sol* from th'Eaſt proclaims the new-born Day,
Or Silver MOON reflects the borrow'd Ray; 7.
The Woodland Songſters, at their riſing Hour,
With warbling Notes ſalute the SHADY Bower; Quære.
From SCOLDING WIFE the peaceful Walks invite, 5.
And ſmiling Nature ſtrives to raiſe Delight,
Soft, gentle *Zephyrs* breathe an healthful Air,
And BEEF and 'TATOES Fruitfulneſs declare; 9. 6.
The yellow Fields no noiſome Vapours blaſt,
Nor flow'ry Meads peſtif'rous INSECTS waſte: 11.
Here Learning, CHARITY, and Plenty ſmile, 1.
The choiceſt Bleſſings in fair *Albion's* Iſle;
Majeſtic Piles, magnificently grand,
With GARTERS, COATS of Arms emblazon'd ſtand; 13. 3.
Which juſtly ne'er can undiſtinguiſh'd die,
Nor in the BED of dark Oblivion lie, 12.
May * PATTEN's Deeds ne'er WANT immortal Fame, 2. 8
Nor they whoſe Merits claim a deathleſs Name:
But uneclips'd, in future *Annals* ſhine,
Secure from Malice, and the Length of Time.

* *The Founder of* Magdalene College *in* Oxford, *and High Chancellor of* England, Anno Chriſti 1449.

The Ænigmas anſwered in the Character of a SCOLDING WIFE, by *William Ingram* of *Corfe Caſtle*.

Dear *Tom*, I think no Man in Life,
Was plagu'd as I am with a WIFE; 5.
Know firſt, ſhe's *jealous* as the D——l,
Poſſeſs'd——poſſeſs'd of all that's evil;
If you for real WANT ſhou'd die, 8.
She'll ſhew no Spark of CHARITY! 1.

Th'inconstant WEATHER-COCK, or MOON, 4. 7.
Don't vary, nor yet change so soon:
My WITS are work'd ten thousand Ways, 10.
And constantly employ'd to please;
Full oft her PATTENS at me flings, 2.
And those (dear *Tom*) are d—n'd hard Things;
Thus teaz'd, I pine to that Degree,
I've scarcely Strength to kill a FLEA! 11.
In th'Garden too I've try'd my Skill,
And got POTATOES for Good-will; 6.
Of which she's fond, and seemed kind,
Yet soon to all my Kindness blind.
One Day was sent me from a Friend,
SIRLOIN *de* BEEF; but mark the End: 9.
The *Messenger* in modish Dress,
Sold GARTERS, *Buckles*, and BED-*Lace*; 13. 12.
She met, just entering in the Hoose,
With —— Ma'am, "here's something for your *Spouse*;"
The *Basket* soon away was thrown,
You louzy, stinking *Whore!* be gone!
She then began to stamp, and swear,
And made poor *Susan* run for Fear:
I offer'd calmly just to speak,
But soon she made *me* fear and quake;
She seiz'd the *Tongs*, and laid them o'er
My Bones, and swore she'd make 'em sore;
My GREAT COAT sav'd 'em, or depend, 8
I should have found no other Friend!
These *Plagues* must bear whilst I have Breath,
For there's no *Remedy* but Death:
Therefore (dear *Tom*) the Danger shun,
And never into Wedlock run!

All the Ænigmas and Quære answered by Mr. *Wm. Heaford.*

First, *Bickerstaff*, of CHARITY does talk; 1.
Then *Thorpe* upon his PATTENS strives to walk. 2.
And *Gaskell* must have a GREAT COAT to wear; 3.
While *Morce's* WEATHER COCK still fronts the Air: 4.
I like not *Sadler's* Choice: For it's a SCOLN, 5.
Roulson's POTATOE may please Young and Old: 6.
But *Harris* to conceal the MOON does strive; 7.
The Character of WANT, does *Wildbore* give: 8.
Vaughan's SIRLOIN of BEEF may prove a Friend, 9.
And *Atkinson* may more his WIT extend: 10.
Friend *Swift* has got a FLEA, perhaps in's Ear, 11.
In BED at *Twelve* you'll likely find *T. Beer.* 12.
Clark boasts his GARTER: *Gents*, I am in haste, 13.
Atkinson's SHADOW, darkens all at last. Quære.

All the Ænigmas and Quære answered by Mr. *T. Harris.*

A *bold* Pot-Companion to th' *Tavern* did go
While PHOEBE displayed her Light, 7.
His WIFE she came SCOLDING, and said, Is it so? 7.
What the Plague! Don't you know when 'tis Night? *My*

My Dear, ſaid the *Huſband*, I hope there's nought wrong,
Go, pry'thee *Love*, go home to BED; 12.
Said *ſhe*, I'll not go; you will ſtay here ſo long:
And, I ſwear, I'd as ſoon ſee you dead.
The *Huſband* with Fury then GARTER'D her Hide, 13.
And ſaid, Ye *Bitch*, do ye WANT more? 8.
I'm ſure there's none *loſt*, but what's *fallen beſide*;
I've no CHARITY for you,——you W—e! 1.
Then *ſhe* up with her PATTENS, and ſtruck at *his* Head, 2.
And gave *him* a FLEA in his Ear: 11.
He turn'd as a WEATHER-COCK, look'd like a SHADE, 4. Qu.
And ſaid, I am *ruin'd*, I fear!
She *tore* his GREAT COAT, and then *lugged* his Hair, 3.
No Reaſon could govern *her* Tongue:
Tho' he cry'd *Peccavi*, ſhe ſtill did not care,
But ſtill ſhe kept *thumping* along!
And ſaid, for the future I'll make you more wiſe,
Buy BEEF and POTATOES good Store: 9. 6.
She beat him ſeverely, and knock'd up his Eyes;
And call'd *him*, A Son of a W——e.

In this or the like manner, all, or moſt of the *Ænigmas*, and Quære, are anſwered by Mr. *Thomas Barker*, Mr. *Robert Marſh*, Mr. *Tho. Frith*, Mr. *Chr. Maſon*, Mr. *Tho. Sadler*, Mr. *Wm. Swift*, Mr. *Thos. Vaughan*, Miſs *Maria Williſer*, and others.

New ÆNIGMAS to be anſwered next Year.

(1) Ænigma 160, by a Farmer's Grandaughter.

Impreſs'd by *Love*, and bred with Pain;
Soft *Offspring* of Deſire!
I *ſomething* ſeem, yet *nothing* am,
And pure as *vital* Air.
Soft, as when *Zephyr* fans the Trees,
With balmy breathings of the ſouth:
Sweet as is *India's* ſpicy Breeze,
Or lovely *Chloe's* fragrant Mouth!
I own no Features, Shape, or Mein,
Complexion brown or fair;
Felt, I am oft; but rarely *ſeen*,
Yet boaſt a gentle Air.
In ſweet Receſs conceal'd I lie,
Where *Chloe's* hand is often preſs'd
Oh *Strephon!* cou'd'ſt thou then be by
How amply might thy Hopes be bleſs'd!
Whilſt thus I'm nouriſh'd by the fair,
Where can ſhe hide the conſcious Grief?
Yet ev'n amidſt this poignant Care,
I've oft the Pow'r to yield Relief,
Mature, I urge my deſtin'd Birth,
By *Damon's* Vows betray'd;
Chloe in private brings me forth,
Yet *Chloe's* ſtill a *Maid!*

(2) Ænigma 161, by Mr. *Thomas Vaughan*.

Sirs, unto you we dare our Parents tell;
They're *Lillipuoiads*, black as Imps of Hell!
But we their Offspring (let it not ſurprize)
Are white, and red; a thouſand times their Size!
Some love us dearly; while ſome others think
Us filthy, naſty; ſay we baſely ſtink:
We have our Failings, which we'll not deny,
Thoſe who are *too* familiar ſoon muſt cry:
Take one Hint more; we ſeldom ever do
Survive one Year; but never more than two.

(3) Ænigma 162, by *Un-qui-vive-la-bagatelle.*

I, *Gentlemen*, tho' now diſguis'd, attend
Am oft your *Follower*, but your faithful Friend:
Low is my Station, and I ne'er aſpire
At being rais'd (like ſome *Dependents*) higher;
I oft aſſiſt, when Buſineſs you purſue;
And oft am found to Pleaſure uſeful too.
Always *behind*, tho' I *myſelf* remain,
I make *you foremoſt* on the ſcented Plain:
The martial Horſe, with all his boaſted Spirit
Has in th'Attack, to *me* ow'd half his Merit:
Me did the *Errant Knights* of old require,
And found as uſeful as their truſty *Squire*.
Glitt'ring with *me*, the *Beau* a courting goes,
And *Chloe he* can ſcarcely *clip* ſo cloſe;
Yet rare I'm favour'd with the *modeſt* Fair,
And but too oft their juſt Reſentment bear:
When tempting they with ſweeping Trains appear,
I (hard Reſtraint!) muſt not approach too near.

(4) Ænigma 163, by Mr. *Thomas Beer.*

Ratio ultima Regum.

By me Ambition, cruel Diſcords ceaſe:
And warring Nations ſoften into Peace.
Calm, unprovok'd in Priſon tho' confin'd,
And to no Acts of Cruelty inclin'd:
But when inflam'd by Man's unbounded Rage,
Then Pow'r, nor Force, my Fury can aſſwage!
My Diſpoſition ſuch:——In Tears I leave
The widow'd Wife a Huſband's Loſs to grieve!
I Kings intimidate—the Brave diſmay,
And laurel'd Heroes own my pow'rful Sway:
Dire hoſtile Foes intrepid I diſarm,
And dauntleſs Sounds the Trumpets War alarm!
Now hear my *Nameſakes* Uſefulneſs diſplay'd,
And Properties thro' every Scene convey'd:
From frail Mortality, I Mortals lead,
As I direct, the learn'd Divines proceed.
In Mathematics, I obtain a Place,
In Printing too am held without Diſgrace:
In Surgery an uſeful Part I claim,
In Muſic too mine is a pleaſing Name:
Stop here my Pen!——Let Artiſts me reveal,
In riddling Lines I would my Name conceal.

(5) Ænigma 164, by Mr. *Iſaac Tarratt.*

I am an Eye that never had Sight,
When alive I am bury'd, when dead bro't to Light:
I belong to a Man, that's a very great Whore,
Admir'd by the Rich; overlook'd by the Poor.

(6) Ænigma 165, by Mr. *Thomas Allen.*

When ſhaking Thunders roll along the Skies,
Or Vapours into duſky Clouds ariſe;

When Storms my ancient Empire do invade,
Imperfect I exist——Obſcureſt Shade
Of Winter's tedious Nights, or beaming Noon,
Are equally my Foes, the Sage will own.
When I (propitious) mount the Stage ſerene,
Ev'n *Critics*, *Beaus* and *Belles* admire the Scene;
My Count'nance then the *Virgin-Bluſh* diſplays,
Lovely as *Iris*' variegated Rays:
Tho' firſt when theſe engaging Charms I ſhew,
You'd think I am the Harbinger of Woe,
For oft ſucceſſive Tears inceſſant flow;
But re-aſſume my *Roſy-Bluſh* again,
I ſoothe with Hope th'induſtrious anxious Swain.
Milton (poetic Prince) with Thought elate,
My (oft-times) beauteous Mantle terms ſedate.
Tho' I *Sumatra's* ſcorching Clime reſort,
It ſeems reluctant;——there my Viſit's ſhort;
On *Albion's* happier Plains am oftener found,
Attendant on the *Goblins* nightly round.
Take this Hint more, before I bid Adieu,
A Riddle-Writer ſhould have me in View.

(7) Ænigma 166, by *Dablerus*.

When hoſtile Foes, with Hopes of Spoil elate,
Approach the Frontiers of ſome wealthier State;
The Beacon's glare, conſpicuous from afar,
Summons her Sons, alarms them of the War!
So, a Forerunner oft, e'er I appear,
Gives publick Notice that my Birth is near:
My Birth quite odd, a Paradox to Nature,
You'll ſay, when told, I *come* before my *Pater*;
Inſtead of dread Alarms, ſpread Joys around,
Am welcom'd in with *Muſick's* chearful Sound.
If in mine Infancy the Roſes grace
My Forehead red, or Bluſhes in my Face,
No Preſage good forebodes, but ſure Prelude
Of my b'ing furious, turbulent and rude:
For ſee, in me ſuch Contradictions meet,
I'm oft call'd *bitter*, and as often *ſweet*;
Now ſhort, then long: my Aſpect fair, then brown,
Now ſmiling chearful, then an angry Frown.
Perhaps, ſome time when I look kind on you,
Others my dreaded Face may juſtly rue:
So the ſame Cloud that ſmil'd on *Jacob's* Race,
On *Egypt's* Sons indignant frown'd its Face!
Tho' theſe my Frailties; let me next rehearſe
My better Part——The *Medal* quite reverſe:
Priz'd, lov'd, approv'd of by the Wiſe and Good;
My Worth to many little underſtood:
The *Imps* of *Luxury* deſpiſe my Grace,
Neglect my Uſes, ſhun my lovely Face;
Though precious as the coſtly glitt'ring Gem,
Of Life the Emblem, and the *Guide* of Man.

The

The Worms of Earth, who puff their *noble* Birth
(Tho' by the bye, no more than *Mother* Earth)
They vaunting boaſt of their illuſtrious Line,
'Tis Farce, vile Mock'ry; when compar'd to mine:
Tho' *wide* my Graſp, yet *narrow* is my Span
Of Life; ſhort Durance to the Life of Man.
My Period near approach'd, then weak my Pow'r,
Oft ſilent Tears attend my dying Hour.
My Exit made, to Realms beneath I go,
Oft piercing Screams ſucceed when launch'd below,
Leaving behind the Livery of Woe.

(8) Ænigma 167, by Miſs *Maria Williter* of *Epſom*.

Dear *Gentlemen!* by your Command,
I'm ſent where'er you pleaſe;
Either to reſt upon the Land,
Or fly beyond the Seas.
For I can leap from Pole to Pole,
Within a Moment's Space;
And all Obſtructions can controul
To find th'appointed Place.
Or, if I ſhou'd amidſt Alarms
Be ſet before my Foes,
My obdurations Talent Charms,
Would give them direful Blows.
For I can plunder, burn, and kill,
And none can me withſtand;
Or in the leaſt reſiſt my Will,
When I ſhall give Command.
I viſit Non-exiſtence' Cell,
And come from thence with Eaſe
Or rather make a Tour to Hell,
And come back when I pleaſe.

A Quære, by Miſs *Maria Williter*.

Dic, quibus in terris inſcripti nomina Regum Naſcantur Flores.

2d Quære, by *Un-qui-vive-la-bagatelle*.

Quæ eſt in certarum rerum certiſſima cunctis?

A Rebus, by Mr. *William Ingram*.

To one half of the Place where Sin firſt took its Riſe,
Add three Fourths of a Term us'd for *Kitty*;
When by Chance the young Maid proves an amorous Jade,
And 'twill ſhew ſomething contriv'd by the Witty.

An *Alphabetical* Catalogue of Contributors to this *Diary*: Wherein the Figures 1, 2, 3, &c. ſhew the Queſtions, and the Numericals, i, ii, iii, &c. the Ænigmas each Contributor anſwered, &c.

Mr. Tho. Allen 6. 8. 9. 12. 15. pr. 1. Qu. & 1. Æ. Mr. J. Atkinſon, all in V. Mr. Tho. Barker, 1. 4. 5. 6. 7. 14. all in V. prop. 2. Qu. i. Æ. 1 Reb. Mr. Tho. Barnett 1. 6. 8. Mr. Sam. Beeken Æ. prop. 1. Q. Mr. Tho. Beer, all in V. Prop. 1. Æ. Mr. Tho. Bramley 1. 2. prop. 1. Reb. Mr. G. Brown. All Qu. prop. 1. Mr. John Buddle 1. 2. 4. 9. ii. iii. vii. viii. Mr. Wm. Chapman all Æ. & Q. prop. Calc. Tranſ. Venus. Mr. John Clark, prop. 1 Æ. 1. Reb. Mr. James Croom. 1. all Æ. but 5. and 13. Dablerus prop. 1. Æ. Mr. Tim. Dray 1. 2. 3. 7. 8. 9. 12. 14. 15. all Æ. but 10. Mr. W. Eaton 1, 2. 4. 8. 9. 14. Mr. Wm. Embleton 1. 2. 6. 7. 8. 9. 14. all Æ. but 9. Mr. Luke Elſtob ii. iii. iv, v, vi, ix. & Qu. Calc. Ecl. Mr. W. Foſter. 1. 14. ii. iii. iv. vi. ix. prop. 1 Qu. Mr. Thomas Frith all in V. Mr. John Goodhead all Q. and all Æ. Mr. Henry Green all Qu. and all Æ. Mr. Tho. Harris all Æ. in V. prop. ii. Qu. 1. Æ. Calc. all Ecl. & Venus Tranſ. Mr. John Harrington all Æ. but 9. Mr. George Haydon all Æ. but 10. pr. 1. par. &c. &c. &c.

FINIS.